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PSYCHOSOMATIC MEDICINE

*Experimental and
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PSYCHOSOMATIC MEDICINE

EXPERIMENTAL AND CLINICAL STUDIES

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PURPOSE: The aim of PSYCHOSOMATIC MEDICINE is to encourage and bring together studies which make a contribution to the understanding of the organism as a whole, in somatic and psychic aspects. The field to which PSYCHOSOMATIC MEDICINE is devoted is rapidly assuming importance in medicine and the related sciences. The traditional body-mind dichotomy, while now less present in medical thinking, is not eradicated from language. Expressions which, during the last decade, have gained increasing prominence in medical literature, such as the organismal theory, the patient as a whole, psychosomatic problems, psychophysiology, psychobiology, were all attempts to avoid the artificial division of the psychological from the physiological. It is now realized that the major problem is not to find the term or label to indicate the essential unity of the organism, or to engage in philosophical discussions about monism, dualism or parallelism, but to develop practical methods for dealing clinically and scientifically with the organism as a whole. Although the organism is a unit, fundamentally different methods have been developed for the observation and management of the psychic and somatic functions. This fact is the real reason for the use of the term psychosomatic, not any difference of opinion about the essential nature of the organism.

The ability to deal with the psychic aspect of an illness, or with the patient as a person, has been called the art of medicine in contradistinction to the science of medicine. But this association of ideas has tended to preserve a dichotomy. Most physicians would agree that there is an art and a science for dealing with physiology as well as psychology. The fact that studies relating to them tend to be isolated from each other in our scientific literature constitutes the reason for this publication.

Psychosomatic medicine is not a medical specialty, parallel with internal medicine or psychiatry, but an approach which might be applicable to almost any medical, psychological or physiological problem. The consequence is that nearly anything the Journal publishes might be suitable for one or another of the specialized scientific journals, yet its suitability for this Journal depends not only on its scientific excellence but also upon its pertinence to some specific issue involving observations or experiments on both personal reactions and organic reactions.

SCOPE: The investigations published in this Journal will deal primarily with phenomena observed concurrently from somatic and psychic aspects rather than from either one alone. The scope therefore will include appropriate experimental studies of animal and human behavior, and well-controlled clinical studies of children and adults. Pertinent examples are: investigations of experimental neuroses, of frustration, of physiological changes accompanying emotion, of vegetative and hormonal disturbances, and of psychiatric aspects of general and specific emotional problems.

The Editors are not disposed to accept manuscripts which present purely psychiatric material without observations and data relative to physiological events, or material relating to any of the specialties of internal medicine which is not accompanied by sufficiently adequate observations to throw light on the psychosomatic mechanisms involved.

The Journal includes articles containing reviews of literature in the field of the medical and research specialties.

Reviews of articles and books relating to this field will also be published.

MONOGRAPHS: To meet the increasing need for publication of experimental data resulting from longer studies, monographs independent of the Journal itself will be published as occasion requires.

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THE STRESS TOLERANCE TEST*

PRELIMINARY EXPERIMENTS WITH A NEW PROJECTIVE TECHNIQUE UTILIZING BOTH MEANINGFUL AND MEANINGLESS STIMULI**

M. R. HARROWER AND ROY R. GRINKER

INTRODUCTION

The formulation of this test was stimulated by two distinct and practical needs of the military psychiatrist. He has searched in vain for a test to determine the degree to which a civilian could adapt to the holocaust of war *before* developing unendurable anxiety, and he has also needed an objective procedure to determine the presence of combat-stimulated anxiety not yet mastered by men *after* their combat experiences. This study deals only with the second problem which is now the concern of civilian psychiatrists and all physicians working with demobilized combat veterans.

The psychiatrist using brief methods of psychotherapy is never quite sure of the degree of recovery that his patient has attained (1). Can a patient, who seems to be making an excellent adjustment in the protected environment of the hospital or who is attaining much needed gratification in the transference situation, meet the infinitely greater demands and stresses of civilian life? Alone with the physician some patients loosen all control of their anxieties often to achieve the secondary gain of delay in return to duty, or in the case of veterans, added monetary compensation, yet in group activities these patients are vigorous and adaptive participants. Others maintain impervious control of their emotions or simulate improvement in order to return home quickly or to escape the unpleasant side of hospitalization. Our test was an attempt at an objective measure of the degree of the individual's recovery.

Again, because of the lack of sufficiently trained personnel much psychotherapy at the present time is done in groups, and consequently the therapist often has no intimate knowledge of his individual patients and has difficulty in evaluating the pa-

tient's anxieties. We found that the answers given to this test were in many cases extremely revealing in relation to the particular problem of a given individual over and above the fact that they indicated whether or not he was still seriously disturbed.

It must be clearly understood that we were not attempting to measure the *degree of residual anxiety per se*, but rather to assess the capacity of the ego to master that anxiety. We felt that the various types of responses of the patients to the stimuli in our new test indicated various degrees of failure on the part of the ego to master or control anxiety in a fashion that would enable him to adapt to either Army or civilian life.

As is stated in the title, this test utilizes both meaningful and meaningless stimuli; specifically the test includes part of the Rorschach Inkblot Series (4), part of the Harrower Inkblot Series (3) and a set of pictures in some ways analogous to the material used in Murray's Thematic Apperception Test (5). From a modification and combination of these two procedures we had in mind certain theoretical questions. For example, would it be possible, now that a parallel set of cards to Rorschach's original ones is available, to pick out changes in an individual's responses immediately following an acutely disturbing situation? If this can be answered in the affirmative then all kinds of "disturbing situations" may be interposed between the two series so that it can be determined what kinds of situations are disturbing to which individuals, and further, what personality traits reflect a change through the medium of the Inkblot Technique. Relating this to our two first questions we might say that the individual whose responses remain essentially the same after the maximum number of "disturbing situations," may be considered as the more stable, bearing in mind the alternate possibility that no change in response to these crucial stimuli may indicate a pathological rigidity of defense.

Another question which we hope to answer was related to the specific "disturbing situation" which we chose to interpose between the two inkblot series. Namely, what kind of reactions to dramatic,

* The authors wish to express thanks and appreciation to the Josiah Macy, Jr. Foundation for making this study and its publication possible.

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** From the AAF Convalescent Hospital (Don Ce-Sar), St. Petersburg, Florida.

colorful, war pictures may be expected from patients with operational fatigue?¹

Since in such a test as Murray's Thematic Apperception (5), one gets identification of the subject with various human figures in a picture series presented to him, it was assumed that these flyers might identify themselves in various ways with some of the figures in our selected pictures, project themselves into situations and thereby reveal the character of their disturbance and anxieties. From this phase of the proposed new technique, the ten war pictures, we hoped to derive concrete and factual material about the subject, his *specific* anxieties, and the defenses he uses to cover up these disturbances. The ink-blot tests on the other hand, *given both before and after the war pictures*, are more apt to tell us something about the structure of the personality and the modification of that structure under specific stress.

In this preliminary report, as the results will show in considerable detail, it would seem as if this test gives us an objective measure of the degree to which an individual has recovered from, or regained control of his anxieties concerning specific situations, and of his changes of retaining relatively permanent stability. We may still advance as a hypothesis, to be tested later, that an undue disturbance caused by the war pictures in persons who have not experienced combat might be an indication of a low threshold, that is, indicative of an early breakdown.

DESCRIPTION OF TEST MATERIAL

The test material used consisted of five of the ten Rorschach slides (Nos. 2, 6, 7, 9, and 10), ten slides of dramatic war and combat pictures and five slides of a parallel series to the Rorschach, referred to as the Harrower Series (Nos. 2, 6, 7, 9, and 10). This new series was derived after an extensive study of the perceptual properties of each individual Rorschach card. Each card in this series, therefore, is the perceptual equivalent of its counterpart in the Rorschach. This means that the war pictures were preceded and followed by meaningless stimuli which had been devised so as to elicit similar responses.

The war pictures, ten in number, may be described briefly as follows:

1. A submarine is surfaced against an expanse of sea. Just above it, an American plane is pulling up sharply. A huge column of water is rising to

one side of the submarine. Men on the submarine conning tower are turning guns on the plane.

2. Another sea picture. To the right hand side, a large battleship is visible. Bursts of fire above it indicate that it has been hit. A similar craft is burning to the left hand side of the picture. In the foreground, in the water, is a sinking Japanese plane, the rising sun on its wing being the only thing clearly discernible in the water. An American plane is in the foreground flying over the small burning ship.

3. Two planes have crashed on very barren terrain beyond which blue sea is visible. From the plane, in the background, arises a huge column of fire and smoke. Three figures in grotesque, helpless positions are lying around the plane in the foreground. From the cockpit of this plane a head and arm of a fourth figure are also visible.

4. In the foreground of this picture are three human figures. A child and a man lie dead on the ground. An axe has fallen from the man's hand and is beside him. A woman stands over them with wild eyes, a look of horror on her face. Behind them, forming a continuous line against the sky, are columns of flame, burning homesteads. In the sky four planes are visible.

5. A cross is in the foreground of this picture. Three brutal-looking men are driving a spear into the side of a crucified figure. These men are dressed in the uniform of the German and Japanese, and flags of the swastika and rising sun are held by other figures behind them. At the same time, from the air, a plane is directing its gunfire at the crucified figure so that the fiery bullets also converge on the same point that the spear is hitting. A column of fire is rising against the dark blue sky. A broken cross stands on either side of the crucified figure.

6. A man is lying in a white hospital bed. His hands are up so that they cover his face as if to keep something away from it. Above him are expressed, in black, purple and reds, weird shapes, the phantasmagoria of his dreams.

7. In the foreground is an immense, pot-bellied, ape-like figure. Slung over his shoulder is a sack which is full of human skulls. Four skulls have just been thrown by him and are about to fall on the ground. He is making a gesture of sowing seed. Other figures behind him are making the same gesture. A vulture is visible on a broken, leafless tree.

8. In the foreground is a battleship seen from behind a gun turret, from which fire is pouring, while members of the crew are running away from

¹ By operational fatigue we mean the neuroses in men engaged in combat either in the air or on the ground.

marine. The Japanese flag is clearly visible on this stricken ship. Two other ships are also blazing in the background. Two American planes are seen in the air, flying over the ships.

9. In the foreground on a rock and beside twisted barbed wire lies a dead soldier with arms outstretched wildly. An unattached head and an arm of a second figure are beside it. Behind him, across a stretch of water, a huge battleship is blazing.

10. In the foreground are seen the face and the two hands of a man about to sink in water which is covered with flames. A ship in the background is sinking. The flames are so near the man that they seem to be coming out of his open mouth. There is an agonized expression on his face.

Numbers 3, 4, 5, 7, 9 and 10 are pictures by Thomas Hart Benton. Their coloring is unusually vivid and dramatic. Most of the backgrounds are a rather deep blue so that the brilliant coloring of the fire and figures stand out against the somber backgrounds. Although the figures are realistic, they have somewhat of an allegoric or symbolic flavor. There is unquestionable "atmosphere" to these six pictures, which is not found in the other four. Numbers 2 and 8, for example, do not have the same symbolic quality as the Benton pictures. Numbers 1, 2 and 8 were taken from pictures by Robert Benny. Number 6 is the one picture in the series which is frankly unrealistic. It was included because of the frequent mention of disturbing dreams by so many patients.

SUBJECTS AND TEST PROCEDURES

Sixty-three patients—all with operational fatigue—and 31 control subjects from the Medical Detachment came for the experimental session in groups of 6 or 7. We soon found, as was to be expected, that the patients gave vent to a good deal of resentment and uneasiness in being called in to take the test. This took the form of repeated questioning as to what the test was about before the instructions were given and in the barrage of remarks during presentation of the first slide. In almost all cases, however, by the time the second slide had been presented they were quiet and cooperative, and in only a few instances would a single individual attempt to attract attention by insisting on making remarks throughout the entire procedure. The control groups, on the other hand, were conspicuously quiet in contrast.

The room was dark during the presentation with the exception of the light derived from the slides themselves. This was, however, sufficient for the

men to write by. The instructions they received varied slightly from group to group depending on whether or not the full series was presented. We adopted two preliminary procedures before deciding on the Standard Test Administration. In procedure I, 27 patients received only the war pictures. We did this in order to find out whether or not this was an unduly disturbing situation and to get a general feeling of the kind of material that would be derived, the amount of time needed, etc. In procedure II, 12 patients received the war pictures followed by the complete Rorschach or Harrower series. This was done to see if disturbances in the ink-blot records were concentrated in any particular cards. Since we wished to restrict the whole experiment to 30-40 minutes, in our final setup, we were anxious, if possible, to use only five of the ten slides from each series. From these two initial groups, it was clear that: (1) relevant material could be derived from the war pictures in a short space of time, and without undue overt disturbance; and, (2) that *five of the slides* in both ink-blot series were more likely to reflect disturbances *than others*. These five were: 2, 6, 7, 9, and 10.

In procedure III, 24 patients and 31 control subjects then received the test in the form in which we decided to standardize it; namely, five ink-blot pictures, ten war pictures, five ink-blot pictures. The Rorschach and Harrower ink-blot series were used alternately in the four sub-groups, to precede and follow the war pictures.

INSTRUCTIONS FOR THE STANDARDIZED TEST

Those men (patients and controls), therefore, who were to receive the full test were oriented to their task in the following way: "You are going to see on the screen, 20 colored slides. The first 5 of these are ink-blot pictures, *i. e.*, they are not pictures of any special thing but have been made just like an ink-blot you yourself might make if you shook a blot of ink from your pen and folded the paper so that the ink was symmetrically smeared. Your task, on looking at these ink-blots, is to put down what they remind you of, look like, or might be. There are no right or wrong answers. You just put down what *you* see. The next 10 pictures are not ink-blot pictures. They are pictures of paintings of real objects; again all that you have to do is to write down the first thing that comes into your mind as you see these pictures, and please be sure that it is the first thing that you put down. Do not censor it because you think I would not approve of it. Put down everything

and anything you think of. The last five pictures will again be ink-blot pictures and again you have to write down what these remind you of, resemble or might be."

The room in which the test took place was so shaped that the projector was placed in a passage-like extension so that the men were, to all intents and purposes, alone in the room with the experimenter not in sight. The small groups that we used necessitated only two rows of chairs, the screen being approximately 6 or 8 feet away from the front row. The image thrown by the powerful projector was 3 or 4 feet in size and unusually brilliant.

The small room and the smallness of the group of subjects undoubtedly facilitated the giving of the test and obtaining the most revealing results. It was possible to maintain a serious atmosphere, to be sure that all the subjects were actually looking at the screen and trying to write an answer. When any individual was unduly disturbed by one of the pictures as exemplified by fidgeting, shuffling with his feet or suddenly coughing, it was possible for the examiner to note this on his record. In the large auditorium, however, when several hundred men were tested together, certain factors diminished the effectiveness of the pictures. These will be discussed later.

RESULTS PERTAINING TO THE INK-BLOT SERIES

It has been almost universally accepted among Rorschach workers that except after long time intervals, or profound changes in personality structure (as for example following psychoanalysis), an individual's second Rorschach record will be in all essentials similar to the first.

Experimental studies (2) on 100 cases in which the time interval between the records was less than 5 days (an interval believed too short for profound personality changes to occur) showed that this assumption was not entirely correct. The second Rorschach record in almost all cases showed an increase in the number of responses and a tendency for the subject to do "better" in the second record. This improved performance was manifested by the fact that explosive emotional answers (CF responses) dropped out in favor of more controlled ones.

This finding is understandable in that color and shading "shock" which may result in failure on certain slides, or in explosive color answers, obtain their effect because of the surprise element which the cards introduce. This surprise element no longer holds on the second presentation of the

card or slide. Failures, therefore, almost invariably occur in the first rather than the second record and explosive answers decrease.

Against this background the findings in the patient group (see Tables I and II) are all the more startling. Taking only the number of failures in the record, *i. e.*, the number of times a given card was sufficiently disturbing to cause complete blocking, we find that whereas only 13% of the control subjects showed a greater number of failures on the second record, 63% of the patients showed an increase. This difference between the two groups is reliably significant with a Chi Square

TABLE SHOWING CHANGES IN RESPONSES TO INK-BLOTS AFTER EXPOSURE OF WAR PICTURES

	Subjects who show an increase in number of failures in 2nd record		Subjects who show no increase in number of failures		Total
	No.	Percent	No.	Percent	
Controls . . .	4	13	27	87	31
Patients . . .	15	63	9	37	24

Chi squared=14.72

TABLE SHOWING CHANGES IN RESPONSES TO INK-BLOTS AFTER EXPOSURE OF WAR PICTURES UTILIZING RORSCHACH SCORING CRITERIA

	Subjects whose 2nd record is less good than first		Subjects whose 2nd record is improved over, or equal to, first		Total
	No.	Percent	No.	Percent	
Controls . . .	7	23	24	77	100
Patients . . .	22	71	9	29	100

Chi squared=12.82

equalling 14.72, with 6.6 required to indicate significance.

The number of failures in the record is a completely objective measure—anyone can count them. However, if even a minimal evaluation of the record is given so that outstandingly poor answers (in terms of Rorschach criteria) are also penalized as well as the failures, exactly the same difference between the two groups is found. Amongst the control group, 77% showed second records improved or equal to the first, whereas only 29% of the patient group fell into this category. This difference is also reliably significant with a Chi Square of 12.82. These figures are given in full in Tables I and II.

From these findings, it is quite clear that, contrary to expectation, the second Rorschach record shows the effect of an emotional disturbance which we must relate to the immediately preceding experiences of the exposure to the war pictures.

Amongst the patient group the effect of these pictures is much greater than on the controls.

CONTROL EXPERIMENT WITH "NEUTRAL" INTERVAL

In order to bring out as clearly as possible the findings indicated in Tables I and II, an additional experiment was made.

TABLES SHOWING CHANGES IN RESPONSES TO INK-BLOTS AFTER EXPOSURE TO NON-TRAUMATIC PICTURES

TABLE III

Patients who show an increase in number of failures in 2nd record		Patients who show no increase in number of failures		Total
No.	Percent	No.	Percent	
4	14	24	86	28

TABLE IV-A

INTERVAL: COCA-COLA

Patients who show an increase in number of failures in 2nd record		Patients who show no increase in number of failures		Total
No.	Percent	No.	Percent	
1	8	12	92	13

TABLE IV-B

INTERVAL: 10 "NON-TRAUMATIC" PICTURES

Patients who show an increase in number of failures in 2nd record		Patients who show no increase in number of failures		Total
No.	Percent	No.	Percent	
3	20	12	80	15

Another group of operational fatigue patients, 28 in number, were given the two series of ink-blot. In this case however, the interval between the two series was one which was calculated to be "neutral" (possibly even pleasant and stimulating), but certainly without reference to combat situations, and not traumatic in nature.

For 13 of these patients this interval consisted in a break in the procedure and the distribution of bottles of coca cola. At the end of this interval, the remaining blot pictures were given.

For 15 of the patients, the interval was filled with ten color slides of as nearly neutral or pleasant toned pictures as possible. These pictures were characterized by the fact that they avoided human situations and included landscapes, seascapes, and farm activity.

As will be seen in Tables III and IV-A and -B

these two intervals had a very different effect on the patients than the traumatic pictures. Table III shows, for example, that 86% of the group responded in a second series with no increase in the number of failures (or even with an improved record); only 14% showed an effect in an increase of failures. Tables IV-A and -B show these results broken down in terms of the two different intervals.

Interestingly enough, these figures are practically identical with those which were found for the control group on the war pictures as seen in Table I. Or, otherwise stated, since these pictures had no particular emotional significance for the patient group, the distribution of their results was the same as the controls on the previous series, for whom the war pictures were not emotionally disturbing.

OBJECTIVE DIFFERENTIATION BETWEEN "MILD" AND "SEVERE" CASES

It is quite clear that a test of this kind, in order to give the most useful results, must be able to differentiate, not only between persons with operational fatigue and persons who are not sick, but also between the "severe" cases and the "mild" cases within the patient group. We spoke previously of its possible use as a yardstick to measure the effects of *different* types of therapy; another important use would be as a routine procedure, prior to a patient's leaving the hospital, to determine whether or not he could be considered as sufficiently on the road to health and normality to justify his leaving. Following our experimental work this routine procedure was adopted in the Don Cesar Hospital.

In the 24 patients whose records we have previously discussed, the clinical diagnosis, in terms of the severity, was not known to the examiner. When these diagnoses were obtained, it was found that of the 24, 14 were considered as severe cases while 10 of them were considered as either mild or severe-improved. Analysis of the results epitomized in Tables I and III in the light of this knowledge showed that 50% of the mild cases gave second Rorschach records which were improved or equal to their first. Fifty per cent showed greater disturbance. The severe group, however, showed a considerably higher percentage of more disturbed records, namely, 82%. This difference was sufficient to justify our belief that we might get a quantitative estimate of the degree of disturbance.

In order to test out this possibility, two groups of cases were examined. The first group was composed of patients whom the various psychiatrists

considered as their *most disturbed cases* at that time. This was a homogeneous group of "Severe Cases." The "control" group was composed only of "Mild Cases."

Results: Comparison of the results obtained from the specially severe group as contrasted with the mild are most significant (see Table V). Five of the 8 severe cases were so disturbed during the war pictures that they left the room with various explosive outbursts—slamming the door and tears. Only one of the three remaining was able to give any answer at all to the second series of ink-blot. His second record had more failures than his first. The other two who remained gave no answers at all to the second series. Nurses reported in 2 cases that when these men returned to the wards they were crying and needed considerable attention before they were restored to tranquillity.

TABLE SHOWING CHANGES IN RESPONSES TO INK-BLOTS AFTER EXPOSURE TO WAR PICTURES—SEVERE VS. MILD

	Patients who show an increase in number of failures in 2nd record		Patients who show no increase in number of failures		Total
	No.	Percent	No.	Percent	
Severe	8	100	0	0	8
Mild	2	21	7	79	9

RESULTS PERTAINING TO THE DIFFERENT TYPES OF RESPONSES DERIVED FROM THE CONTROL AND PATIENT GROUPS ON THE WAR PICTURES

While the discrepancy between the ink-blot series was indicative and valuable, our *main findings* came from the responses to the War Pictures. From a preliminary inspection of the 630 answers derived from the patients and the 310 derived from the control subjects, several marked differences immediately appeared. The most striking of these were *Failures* and what we will describe as *Personalization* of answers, examples of which will be given later. If one inspects the records of both groups of subjects from this point of view, we find that 46 of the 63 patients, *i.e.*, 74% of the whole group, showed Failures and/or Personalization in their answers, whereas only 19% of the control group showed this feature. This, then, is again highly significant with a Chi Square of 24.22. Table VI shows these findings.

Other differences were discovered in the records which have not been dealt with statistically in this preliminary study. Examples of these, however, are given in the following pages.

TABLE EPITOMIZING DIFFERENT PERFORMANCE BETWEEN PATIENTS AND CONTROLS ON ANSWERS TO WAR PICTURES

	Subjects who show failure and/or personalization in answers		Subjects who show no failures or personalizations in answers		Total
	No.	Percent	No.	Percent	
Controls ...	6	19	25	81	31
Patients	46	74	17	26	63

Chi squared=24.22

The question may perhaps be asked why any persons amongst the control group showed Failure or Personalization in the series of war pictures and, in the case of the ink-blot series, showed a second record inferior to the first.

No detailed study was made of these individual cases but several suggestions may be offered as to why such persons should be found in a control group. In the first place, scrutiny of any so-called control group by psychological tests with high dis-

TABLE EPITOMIZING DIFFERENT PERFORMANCE BETWEEN MILD AND SEVERE CASES ON ANSWERS TO WAR PICTURES

	Subjects who show failure and/or personalization in answers		Subjects who show no failure or personalization in their answers		Total
	No.	Percent	No.	Percent	
Mild	11	50	11	50	22
Severe	18	82	4	18	22

Chi squared is 4.94. Significant at the 5% level.

TABLE VIII

	Total number of answers personalized or failed	Total number of answers neither personalized nor failed
Mild	34	186
Severe	99	121

Chi squared is 45.52

criminative power brings to light a certain percentage of maladjusted persons. In the second place, we frequently find in the medical detachment men who for some reason are either physically or psychologically unfit for overseas duty. And in the third place, the type of screening for a medical detachment is much less exhaustive than it is for Air Corps personnel. It would not be at all surprising, therefore, to find in any such group of control subjects persons with some neurotic and psychological difficulties.

In Tables VII and VIII we have contrasted the performance of cases diagnosed as mild, as opposed

to those diagnosed as severe, on their answers to the war pictures. The higher incidence of Failure or Personalization amongst the severe group seems to warrant the assumption that the degree of dis-

Controls

- 106 Applicants for serving the Merchant Marines
35 Post-combat aviators considered symptom free
33 Pre-combat aviators, part of an experimental group who were being studied systematically by a battery of psychological tests.

Patients

- 83 Severe cases
40 Cases previously diagnosed as severe—now considered improving
40 Cases previously considered mild—now considered improving

turbance was reflected quantitatively in the Stress Tolerance Test. Whereas there are 34 answers personalized or failed amongst the mild group, there are 99 such answers amongst the severe cases. This difference is statistically significant.

SUMMARY OF THE STATISTICAL RESULTS

The statistical results of both phases of this sample study would, therefore indicate:

(1) A Rorschach record taken immediately after a (hypothetically) disturbing situation may show changes which previously would not have been expected to occur except as a result of a change in personality structure.

(2) There is a reliably significant difference between the performance of a group of patients suffering from operational fatigue and a control group in that a markedly greater number of patients reflect this change for the worse in the second Rorschach record.

(3) *The spontaneous responses to the war pictures of the operational fatigue cases show easily detectable differences from the responses in the control group. The frequency of the occurrence of these characteristic responses is statistically reliable.*

Although not considered statistically, analysis of the answers of the patients to the war pictures revealed several other characteristic deviations from the answers of the controls. These were *Evasion* of the meaning of the picture in various ways, *Explosive Outbursts of Feeling* and *Univerbal* answers. In a later section these answers, together with Failure and Personalization will be illustrated and discussed from the point of view of their possible significance in the patient's symptomatology. They have been used in the following section without further amplification as criteria for differentiating records in one of the large scale investigations under discussion.

INVESTIGATIONS WITH LARGER GROUPS

Subjects Examined

In addition to the preliminary experiments conducted with the small groups, the results of which

were treated statistically in order to give an indication of the usefulness of the test, the records of the following groups of controls and patients were also studied:

Of the 83 severe cases, 37 were officers, 46 enlisted men. Of the severe improving cases, 17 were officers, 23 enlisted men. Of the mild cases, 22 were officers, 20 enlisted men. These patients and controls were all examined in large auditoriums which introduced new conditions to be discussed later.

In addition to these 174 control subjects and 165 patients the records of 227 flyers from a redistribution center were also examined. Of this total, an unspecified number were cases with severe disturbances. The rest had been judged as having no symptoms of anxiety. These records were not taken by the examiner. They were administered at the redistribution center and sent for analysis.

The Influence of the Larger Auditorium

In administering the test in a large auditorium, the examiner was confronted with very different conditions from those pertaining in the small room with 6 or 7 subjects comprising the group. These different conditions undoubtedly affected the results of the test to some extent.

In the first place, the pictures on the screen no longer seemed to "engulf" the subject, but were, except for persons in the few first rows, merely pictures seen at a distance. They, therefore, lost tremendously in power and forcefulness. The distance between the subject and the screen literally separated him psychologically from the disturbing situation.

This in all probability explains the decrease of personalized answers which was found. The ego was not pulled into the situation in the same way and stood a better chance of remaining aloof.

In the second place, there was a very different group atmosphere in the large auditorium. Patients did not come to the test with the same attitude as in the preliminary experiments. They gained support from one another's wisecracks and thereby more easily escaped from the situation through bravado and cynicism. They protected each other. Since the large auditorium could not be made as dark as the small rooms, there was also the feeling of having to maintain a front for the benefit of the next fellow.

Because of the looseness of the group, the difficulty in bringing them to order and the various acoustic problems, the whole procedure gained a casualness not present in the original experiments. Thus, failure and evasion and monosyllabic answers became more frequent while Personalization and the direct expression of feelings decreased.

Results

In our preliminary experiments we had come to look on three criteria as significant of whether or not an individual was disturbed. These were:

1. That the performance in the second ink-blot series was less good than the first;
2. That failures occurred in the description of the war pictures;
3. That personalized answers were given.

These initial criteria were modified for the evaluation of the records of the subjects examined in the larger auditorium. From the consideration of these records it seemed as if failure in *either* ink-blot series must be considered as indicative of disturbances regardless of whether or not a greater number of failures was evidenced in the second series. For example, an individual with two failures on the first ink-blot series, and two failures on the second, would not, according to our preliminary manner of scoring have been screened out, because his second record was no worse than the first. It is clear however, that these four failures indicate a disturbance and blocking just as much, if not more, as would two failures occurring only in the second record.

We also found that in addition to Personalization, other qualitative features of the responses were important.

The tables that follow therefore, have expressed our results in two different ways. Table IX contrasts the performance of the 174 control subjects with the 165 patients. In this Table, failures alone have been considered. When 9 or more out of the possible 20 answers were failures, we have considered such an individual very seriously disturbed. When 5 or more failures out of the 20 answers occurred, such an individual was considered sufficiently disturbed to be screened out by the test.

Several interesting facts can be seen from this Table. First there is good agreement between the test and the clinical diagnoses which were made independently in that the "clinically severe cases" did considerably less well than the other patients in the test. It should also be noted that the enlisted men show more marked disturbances than do the officers, a fact which was also in complete agree-

ment with the clinical impression. From this test it would seem that the enlisted men although clinically considered improved, were less able to have made such a recovery basically than the officers.

TABLE IX

COMPARISON OF PERFORMANCE OF CONTROL SUBJECTS AND PATIENTS

Control subjects	No.	5 or more failures (percent)	More than 9 failures (percent)
Applicants for service in			
Merchant Marine	106	3	0
Post-combat aviators	35	9	0
Pre-combat aviators	33	6	3
Patients			
"Severe"—Officers	37	32	5
"Severe"—Enlisted men...	46	43	20
"Severe and moderate improving" ..			
Officers ..	17	6	0
Enlisted men ..	23	26	9
"Mild and mild improving" ...			
Officers ..	22	5	0
Enlisted men ..	20	30	5

TABLE X

COMPARISON OF PERFORMANCE OF CONTROL SUBJECTS AND PATIENTS

	107 Patients from redistribution center		107 Applicants for Merchant Marine	
	No. persons	No. instances	No. persons	No. instances
Failures in first 5 ink-blot...	43	84	16	23
Failures in 2nd 5 ink-blot...	55	123	16	27
Failures in War Pictures...	40	85	13	14
Evasion	24	52	1	1
Details	5	12	0	0
Facetious Remarks	9	10	0	0
Univocal Answers	41	223	26	54
Perseveration	9	29	0	0
Personalization	18	44	1	2
Feelings Expressed	27	51	1	1

In Table X the results of 107 disturbed cases from the Redistribution Center have been compared with those of an equal sized group of the merchant marine applicants. Using our detailed differentiating criteria, it will be seen that a much higher number of the patients show each and all of these various types of disturbances.

ANALYSIS OF TYPES OF ANSWERS GIVEN TO WAR PICTURES AND SAMPLE RECORDS

The instructions for the test called for the "first thing that comes to mind on seeing the picture" to be written down. For the control subjects these

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instructions were almost invariably taken as an order to describe what they saw on the screen before them. That is, assuming that the scene did not call up some specific personal recollection, the instructions could best be followed by simply stating what was seen.

Two examples from the records of members of the medical detachment follow. Each answer will be seen to be a literal description of the picture on the screen.

Sample Case from the Control Group

1. Naval battle with carrier plane flying away after dropping a bomb on a submarine.
2. A Naval battle with burning boats debris in the water, a big wagon turning loose her guns.
3. Wreckage of two planes one on fire, the other with a dead pilot leaning out of his plane, also dead or injured flyers on the rocks.
4. Enemy planes flying away after dropping bombs on farm house injuring the father and daughter—the mother weeping.
5. A picture showing the Nazi persecuting some one on the cross—showing they are against Christian religion.
6. A patient having battle dream after returning from combat zone.
7. A jap soldier strewing skulls out on the ground showing no respect for human lives.
8. Naval battle with a Japanese vessel under bombardment—her super-structure knocked down—her men trying to get away.
9. Two soldiers killed on the beachhead—lying on a rock—large boat burning and ready to go under.
10. A man struggling for life in the water with the oil burning on the water—going down for the last time.

Sample Case from Control Group No. 2

1. Airplane bombing a submarine.
2. A battle at sea in which a ship has been blown up and with wreckage floating around.
3. Two planes have crashed on a rocky coast and dead and injured men are strewn around.
4. A picture in which planes have wrecked a family's home and they have lost about all they own.
5. The cross with Jesus on it and modern men and weapons killing him.
6. A delirious person imagining such things are around him.
7. A person in command of enough people to dispose of them as he wishes and who likes to kill.
8. Japs trying to get away from planes that are strafing them.
9. Men that made it to shore from a wrecked ship, but are about gone.
10. A drowning man grabbing for anything.

It seemed to us that the patients found this apparently simple task difficult. They either wished to avoid description because the picture touched off too many painful recollections and they therefore erected barriers to protect themselves, or they could not keep these personal recollections out of their

replies and were swamped by them, recording their feelings or intimate personal experiences.

Avoiding description took the form of blocking, that is of failure to answer at all, or of evasion of the meaning of the picture. This evasion was accomplished either through some general, non-committal remark by a flight into cynicism or facetiousness, or, by riveting attention on some tiny prosaic detail.

When the personal aspects of the ideas evoked by the pictures were too strong for either repression or evasion we find that there appear purely personal answers or answers in which explosive feelings were given vent to. Such feelings might be of disgust, aggression, fear, guilt or even the evoking of attendant bodily sensation, such as noise and heat. These might be characterized respectively on the one hand as a retreat or retrenchment of the Ego, or on the other hand, its over-participation in the task.

When both these extremes were avoided the attempts at pure description still differed from those of the controls in that they were frequently monosyllabic, while some even included perseveration of the monosyllables.

Thus, whereas the control subject No. 1 described picture 3 as "wreckage of two planes—one on fire—the other with a dead pilot leaning out of his plane—also dead or injured flyers on the rocks," we find that the patients frequently responded somewhere along this range:

Failure, evasion, univocal or monosyllabic description, personalization, uninhibited feelings.

Specific examples may make this clearer:

Failure: No response.

Evasion (through general remarks): A war poster. Painting.

Evasion (through cynicism): Pure propaganda! Touching scene!

Evasion (through attention to detail): Parts of a wheel of a plane.

Univocal or Monosyllabic Description: Crash.

Personalization: My co-pilot lying dead. Billy.

Feelings Expressed: Oh my God! I can't stand such pictures. Reminds me of my own fear. I hate the Nazi. I hate to think how much of this I have caused. This makes me feel sick.

We may now consider each of these deviations in turn, giving more examples both of isolated answers and of complete records which seem to be dominated by one particular mode of reply.

Failure

At first sight it may seem as if there were nothing much that could be added here, beyond the fact that failure was expressed either by a space being left, a line being drawn or the words "can't answer" or "don't know" written in. However, it is well to be certain that the degree of abnormality of such a response is clearly understood.

We know from the Rorschach test that failure is seldom an intellectual affair. That is, the subject rarely refuses to give an answer to the ink-blot because it is actually too difficult a task for him. Far more often he is disturbed by some aspect of the blot (frequently a sexual reference), so that the ideas he might have had are never made explicit consciously or, having reached consciousness, are rejected as unacceptable. If this is the case for ink-blot pictures one may assume that the same is true in an even more marked degree when the pictures represent actual objects or scenes. Even at the simplest level *something* can be said about what is on the screen.

This fact is clearly brought out in the control experiments. When "neutral pictures" were utilized, as described before, not a single failure occurred in the 150 answers given to those pictures by that group of patients. Again, the merchant marine applicants who formed the large control group, were infinitely less well equipped educationally and intellectually than our subjects. Yet these 106 control subjects produced only 14 failures on the war pictures as compared with 85 failures of an equal sized group of patients from the redistribution centers.

We believe that these failures to reply to the war pictures therefore indicate extreme reluctance on the part of the subject to allow himself to participate in any way in the "dangerous situation," a situation which is clearly disturbing in its nature and liable to touch off anxieties perhaps superficially under control at that moment.

Failures in many cases seem to be the result of cumulative strain. That is, the task was attempted until a breaking point was reached but once that point had been reached, there was no recovery. The records that follow are examples of this feature. They show subjects, all diagnosed clinically as severely disturbed who were able to answer up to a point and then collapsed. We have chosen from many possible examples those which show breaking points at different stages of the series.

One other point might be mentioned in connection with failures. Not all the pictures were

equally disturbing. For instance, pictures 1 and 2 were deliberately chosen on the assumption that they would introduce the subject gradually to his task. Results show that there are fewer abnormal answers of any kind on these two pictures. On the other hand, pictures 3, 4, 5, 9 and 10 were particularly conducive to various kinds of abnormal answers.

Case No. 1	Case No. 2	Case No. 3
1. Navy battle.	1. Near miss.	1. It gets me mad.
2.	2. Bloody mess.	2. War photos piss me off.
3.	3.	3.
4.	4.	4.
5.	5.	5.
6.	6.	6.
7.	7.	7.
8.	7.	8.
9.	9.	9.
10.	10.	10.
Case No. 4	Case No. 5	Case No. 6
1. War.	1. Bombing a sub. Close hit.	1. Dive bomber sinking a sub.
2. Death.	2. Bloody.	2. Bombing of a battleship.
3. Hell.	3. Death.	3. Battle between two pursuits.
4. Horrible.	4. Pity.	4. Killing of innocent people.
5.	5. Nightmare.	5. Germans killing.
6.	6.	6. Bad dreams.
7.	7.	7.
8.	8.	8.
9.	9.	9.
10.	10.	10.

Evasion

Evasion of the meaning of the picture, or an attempt at an answer which involved no description, took several forms. There were for instance, answers like "a good picture," and "a poster" which were given frequently. Other examples of this type of answer follow:

2. Dull sky. Painting.
3. A good painting. Poster.
4. Poster.
5. Colors. Comic magazine.
7. Good imagination.
8. Navy picture with Hollywood ending.
9. Picture. Some imagination.
10. Poster.

Another form of evasion was the attention paid to small details in the picture, irrelevant in themselves. This has a counterpart in the type of Rorschach response known as the d or small detail areas of the blocks. An excessive preoccupation with the small areas is indicative in the Rorschach of anxiety.

Examples of this type of answer follow:

2. Fire. Fried egg floating in the foreground. Dive bomber.
3. Dead man. Parts of a wheel of a plane.
4. Axe near the ground.
5. Three spots on the top of the photo.
6. Spot on man's chest near heart.
7. Left arm too big. Large stomach on a man.
8. Barrel of gun protruding from turret.
9. Hand outstretched.
10. Enormous teeth and eyes. Double-jointed hand. Outstretched hand.

Evasion through cynicism or facetiousness may be exemplified by the following:

1. Some poor sucker out fighting the war for deadbeats back home.
2. Fantastic, no battle looks like that.
3. One of Walt Disney's dreams.
4. What nice colors.
5. Fantastic. A beautiful scene!
10. Flame swallower. What, no sword! Everybody should know how to put out a floating oil fire!

Univerbal Description

Innumerable examples of univerbal answers could be given. In the group of 107 patients diagnosed as severely disturbed from the Redistribution Center, 223 answers were single words. The records given here include various types of abnormalities, such as perseveration, failure, and in a few cases personalization and the expression of feelings.

Examples of Records with Univerbal Answers

Case No. 7	Case No. 8	Case No. 9
1. Near miss.	1. After bomb run.	1. Near miss.
2. Direct.	2. Good hit.	2. All hell breaking loose.
3. Tough.	3. Crash.	3. Grim reality.
4. Fear.	4. Sorrow.	4. War.
5. Silly.	5. Strafing.	5. War.
6. Dream.	6. Bad dream.	6. Hangover.
7. Propaganda.	7. Propaganda.	7. Failure.
8. Bombing.	8. Sea battle.	8. War.
9. People I've seen in French towns bombing.	9. Dying.	9. War.
10. Careless.	10. Fire eater.	10. Fear of drowning.

Further Examples of Records with Univerbal Answers

Case No. 10	Case No. 11	Case No. 12
1. Good hit.	1. Near miss.	1. Ack ack.
2. Good hit.	2. Drowning.	2. Hell.
3. No good.	3. Crazy.	3. De L. 20.
4. No good.	4. Poor people.	4. Bombing.
5. No good.	5. Ugly.	5. Strafing.
6. Me.	6. Imaginative artist.	6. My dreams.
7.	7. Freak.	7. Death.
8. Good deal.	8. Fire.	8. Bismarck sea.
9. Failure.	9. Crazy.	9. Convoys.
10.	10. Drowning.	10. Bismarck sea.

Case No. 13	Case No. 14	Case No. 15
1. Plane.	1. Over target.	1. Bombing.
2. Fire.	2. Hell.	2. Bombing and strafing.
3. Fire.	3. Return from a mission.	3. Wrecked aircraft.
4. Fire.	4. Nightmare.	4. Bomb.
5. Death.	5. Fantasy.	5. Strafing.
6. Nightmare.	6. Night before a mission.	6. Drunk.
7. Fire.	7. Nightmare.	7. Killer.
8. Fire.	8. Nightmare.	8. Bombing and strafing.
9. Fire.	9. After a mission.	9.
10. Fire, man drowning.	10. On a mission.	10.

Personalization

When the preliminary experiments were carried out in the small room, personalization of answers seemed to us to be the most important characteristic of the records of the disturbed patients. However, in the investigations in the larger auditoriums, it seemed as if even with equally disturbed patients, personalized answers were given less frequently. The reason for this has been suggested. Examples of personalized answers now follow:

1. I'm tired of bombing.
2. Glad I'm here. None of that for me. Thank God I'm here.
3. Our squadron after the raids on Thanksgiving night. The crash my co-pilot had. My co-pilot dead. Our boys shot down. Buddies at the base.
4. An Italian family I saw one day. Reminds me of my own fear.
5. I am glad I am an American.
6. Me trying to sleep at night. My dreams. One of my nightmares.
7. Bring to mind friends who were killed.
8. Something I don't think I could stand. Thinking of my brother.
9. Reminds me of a couple of plane crashes. I dread to think how much of that I have caused. Maybe somebody I knew. Thinking of my brother. Billy.
10. I am glad that did not happen to me. That might have been me. Thinking of my brother.

Individual Records with Personalization

Case No. 16	Case No. 17	Case No. 18
1. Torpedo bombing.	1. When I was in dive bombers.	1.
2. My convoy destroyed.	2. D-Day.	2. Reminds me of the time when I came back from England. Boat was on fire in a convoy after being hit by German torpedo.
3. My co-pilot cracking up.	3. When I saw Roland go down.	3. Reminds me of time a B-17 crashed in England, and killed 7 of my friends.
4. Gives me the jitters.	4. What the people we bomb go through.	4. Reminds me of a bombing raid on London where several people were killed.
5. Makes me feel funny.	5. The enemy.	5.
6. Dreams.	6.	6. Reminds me of a fantastic dream.
7. Nothing, can't think.	7.	7.
8. The convoys we smashed.	8.	8. Reminds me of strafing by Germans.
9. More dead people, always dead.	9.	9. One man reminds me of one of my best friends that was killed in action.
10. Just gets me miserable. Why don't they bury the dead and leave them go.	10.	10. Reminds me of the time a man from our squadron drowned while swimming in a river in England.

Expression of Feeling

Closely allied to the personalized answers and sometimes hard to distinguish from them were those which showed outbursts of feeling.

Examples of these answers follow:

3. Lousy picture. Lots of horrible things. Morbid despair. Oh my God! Terrible picture. Gloomy and distorted. Not nice to look at. To hell with flying. Unpleasant reaction, don't like it. Just the thought of these pictures gives me the creeps.

4. How many more gruesome ones. Grief and anguish. It's happening too much. Horror on the woman's face. A damn shame. Feeling of disgust, don't want to see No. 5.

5. A picture like that should not be shown. Beastly. Those beasts. I hate the Nazis and Japs. I don't like pictures of this kind, and think the artist must have a perverted mind.

7. Fiendish. Not interested in these pictures. Why show us things like that.

8. Noise. Agony. Revenge. I would not look at these pictures voluntarily.

9. Suffering. Horrible. Gruesome. Too much agony on his face. Why do we have to look at these things. What crap. What the hell, just a waste of time. Oh for God's sake.

10. Terrible way to die. Enough of this old shit, the damn thing don't make sense. Why show us, T. S. Just a lot of dead and dying people. Horrible death. Don't care to think about it.

An interesting addition to the expression of feeling is found in those answers which bring into play other than visual experiences; for example:

1. Noise. Boom. Explosion. Roar of engines.

2. Noise of explosion. Noise of gunfire.

3. Sickish feeling.

8. Noise of explosion. Noise, agony.

9. Don't like blood.

10. Heat. Salt water taste.

We conclude this section with the records of three patients considered as recovered or "improved to minimal" at the time of investigation. They form an excellent contrast with the severe cases already quoted and approximate the control cases very closely.

Case 1

1. There is another enemy vessel getting what it deserves, and also the American spirit in action.

2. More hell turned loose on the Japs, where it hurts. Rough on rats.

3. Tough luck.

4. War is hell, even the poor non-combatants die as well as suffer.

5. The ruthlessness and cruelty of the enemy we fight. Religion and freedom are not wanted by them.

6. A nightmare, what he is conscious of in his sleep.

7. The skull gatherer, a raving, raging enemy.

8. The blazing sun about to set. Another installment of the Japs own medicine.

9. Beyond repair.

10. Doomed.

Case 2

1. The danger of the bomber. He is open to ship fire.
2. Pacific battle. Hit on Jap ship. Ruined Zero in water.
3. Death through accident—collision. No chance for victims.
4. Home blasted by bombers. People killed, driven mad by concussion. No escape from the inhuman massacre.
5. Brutal mutilation and fiendish murder of prisoner of war. Blood streaming.
6. Personal application. A picture of mental suffering by man back from combat, suffering from memories.
7. Brutal war monger sowing death for the next disaster—the next war. A bloody seed to feed upon.
8. A Jap ship undergoing American bombardment. A direct hit killing Japs, uprooting ship's deck.
9. Survivors of ship disaster lying dead on rocks at shore.
10. Survivor unable to help himself, going down for last time, in oil and flames. He is aware of his inability to save himself.

Case 3

1. Moving pictures. Wing and a Prayer.
2. Naval battle—air vs. sea power.
3. Being unprepared.
4. The terror of a bombing raid.
5. The crucifixion of Christ.
6. Nightmare.
7. The story of the sower.
8. The death of a Jap warship.
9. Pearl Harbor.
10. The stark terror on a man's face who knows that he is going to die.

CONCLUSIONS

It has seemed to us from this study that certain clearly demonstrable differences exist between the performance of patients with operational fatigue

and the control subjects in the Stress Tolerance Test.

These differences can be expressed qualitatively and quantitatively, and the extent to which certain characteristic answers appear in a record seems to bear a direct relationship to the severity of the case. While no weighting system has yet been devised which will give a specific numerical point at which a patient should be considered severely, or mildly disturbed, we feel that utilization of the criteria listed in Table X will be of considerable help in evaluating records.

These detectable differences, moreover, are understandable theoretically when viewed in the light of the patient's attempt to cope with a situation which precipitates him suddenly into reliving painful experiences. His ability to handle this experience objectively rather than retreat from it or relive it too closely indicates his progress along the return path to stability.

This test proved valuable when used as an objective measure of the degree of the patient's improvement.

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A STUDY OF CONDITIONED VASOMOTOR RESPONSES IN TEN HUMAN SUBJECTS *

LOUIS A. GOTTSCHALK, M.D.**

INTRODUCTION

The learning of autonomic activities in the human subject, particularly vasomotor reactions, has not been extensively studied in the laboratory. Yet the important rôle of vascular changes in emotions, neuroses, certain psychosomatic disorders, and peripheral vascular diseases is generally accepted. The understanding of the dynamics of the peripheral circulation in conditioning situations would seem to offer promising information concerning the workings of the autonomic nervous system in health and disease as well as to contribute to our knowledge of conditioned responses.

Menzies has already reviewed briefly the significant investigations in experimental conditioning of autonomic activities and has contributed original data (16). Marinesco and Kreindler have studied conditioned vasomotor reflexes in normal subjects and in certain psychiatric and neurological types (14).

The purpose of this study was as follows:

1. To demonstrate that positive conditioned vasomotor responses can be established in the human subject.
2. To compare the objective data obtained during conditioning with introspective material obtained at the same time.
3. To determine whether there is any relationship between vasomotor imbalance and degree of vasomotor conditioning.

METHOD

Apparatus

Because of its great sensitivity, comfort for the subject, and directness of registering vascular changes, the photo-electric plethysmograph was chosen as the means of measuring vascular changes in this experiment. Two separate amplifying and recording units were used. One consisted

of a two-stage direct coupled amplifier developed for the study of peripheral blood flow by Hertzman and Dillon and described by them in detail (10); recording through this unit was done by means of an optical system on a moving photo-sensitive film. The other unit consisted of a condensor-coupled amplifier, the output of which was used to activate a field coil and moving coil; recording was done through an ink-writing apparatus. The latter unit is still in the process of development and records obtained from it were not used in the tabulations of this paper. The individual photo-cells for each unit were combined in one holder of the type used and described by Hertzman and Dillon (7, 8), but modified to contain two photo-cells so that simultaneous recordings through each unit could be made from the same location of the subject's finger.

The type of photo-electric plethysmograph used, regardless of the type of amplification, measures the light that scatters in the skin and not the light actually passing through the tissues. Goetz (5) and Hertzman and Dillon (6, 7, 8, 9, 10, 11) have adequately described and tested the reliability of this type of photo-electric plethysmograph.

Subjects

The subjects used were ten, apparently normal, male, paid volunteers consisting of one high school student, five college students, three medical students, and one dental student, ranging in age from 17 to 24.

Stimuli and Manner of Presentation

The unconditioned stimulus was a faradic current, produced by an inductorium and applied through electrodes fastened to opposite sides of the right wrist by a leather strap. Cambridge electrode paste was regularly applied to the electrodes to improve the contact and to eliminate burning. The voltage supplied to the inductorium was maintained at 4 volts obtained from two 2 volt wet cells and this voltage was checked with a voltmeter before experimentation was begun. The secondary coil was adjusted for each individual until he reported the sensation as slightly unpleasant, but not painful. Once a suitable coil setting was found, this adjustment was not changed during the rest

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of the experiment for that particular subject. The coil setting varied within 1 cm. for all subjects. Variations in the intensity of the unconditioned stimulus were avoided as much as possible, for the strength of response has been shown to be proportional to stimulus intensity within certain limits (12).

The conditioned stimulus was visual. It was produced by a 2.2 volt flashlight bulb supplied by a 2 volt wet cell and fastened to the wall at the end of a couch on which the subject lay so that the light was in his line of vision.

The subject rested on this couch in a sound-shielded, darkened room with comfortable furnishings, adjoining the room where the experimenter and recording apparatus were situated. The temperature of the room was maintained between 25°C and 27°C by an air-conditioner, the most satisfactory temperature range for obtaining comparable peripheral blood flow readings (11). The one window in the room was draped with heavy curtains, and the furnishings consisted of the couch, a desk, a swivel chair, an easy chair, and a heavy rug. One piece of apparatus present was the specially designed holder combining the two photocells, the light source to transilluminate the skin, and a hand rest for the left hand. The holder was fitted with a plaster cast of the subject's left third digit into which the subject inserted this finger for purposes of immobilization. Other equipment present was: electrodes for the transmission of the unconditioned stimulus, fastened to a leather wrist strap; a small flashlight bulb which served as the conditioned stimulus; a push button which the subject was instructed to press with the free fingers of his right hand whenever he made an involuntary or voluntary movement and which indicated such on the records; and a small light pneumograph which was fitted around the subject's chest and which was used to record respiration in order that any deep inspirations producing a vasoconstriction or any regular respirations producing vascular reflexes might be considered in the final computation of data (9, 11, 15). All wires were concealed as much as possible.

The presentation of stimuli was rigidly controlled by a specially constructed timing device made from a multi-speed electric kymograph. Metal strips fastened to the drum base of the kymograph were so arranged that switches controlling the unconditioned (shock) and conditioned (light) stimuli were tripped at definite intervals by the metal strips and acted during definite periods. The time relations used were those found most suitable in the

establishment of a conditioned galvanic skin reaction to sound stimuli using faradic stimulation as the unconditioned stimulus (13). The conditioned stimulus (light) was first presented for 400 milliseconds; then a period of 95 milliseconds followed during which time no stimulus occurred; finally, the unconditioned stimulus (shock) was presented for 75 milliseconds. These temporal intervals were checked on both the optical-photographic system and the ink-writing system. The electrical circuit was so arranged that the light or shock stimulus could be presented separately for the above stated durations.

Measurement of Records

Measurements of the photographed tracings before and after stimulation were made, and the differences were converted into filter units (see footnote, Table I), which allowed quantitative comparisons of records taken on different subjects (8).

The following procedure was used in mensuration of records taken through the resistance-coupled amplifier.

1. Total volume change was measured as the greatest change in the total volume level in either direction (decrease or increase) following presentation of a stimulus. The measurement in millimeters was taken from the foot of the tracing just before or at the moment of presentation of the stimulus to the foot of the tracing at the point of its greatest fall or rise following stimulation. If the direction of change was downward (*i. e.*, decreased total volume), the figure obtained was designated as a minus number; otherwise, it was designated as a positive number.

2. The pulse volume change was measured by subtracting the pulse volume (an average of 10 or more pulse beats) at the onset of the stimulus from the pulse volume at the time of the most marked change in pulse volume following stimulation. The pulse volume of a single beat was measured by dropping a perpendicular from the highest point of the systolic stroke to a point where this perpendicular intersected a line connecting the foot of that systolic stroke and the foot of the following systolic stroke.

3. The latent period of reaction was measured from the onset of the stimulus to the beginning of the most pronounced change in total volume or pulse volume in either direction.

4. The following arbitrary criteria were used to determine whether or not plethysmographic

changes should be interpreted as conditioned responses or as incidental vascular reflexes:

(a) Conditioned responses should not have a latency greater than 5.3 seconds, an observed upper limit for the latency of most vascular reflexes.

(b) A conditioned response should have a minus total volume change and/or pulse volume change. In other words, it must be grossly qualitatively similar to the response produced by the shock (unconditioned) stimulus.

PROCEDURE

The experimental procedure was divided into three sessions taking place on successive days in the evening between 7:30 p.m. and 9:30 p.m. The procedure may be outlined as follows:

First Session

A. Rest Period:

The subject upon arrival was given a sheet of directions to read which told him only that the experiment was a study of reactions of the circulatory system, and acquainted him with just enough of the procedure so that he could cooperate. Any questions he had concerning the procedure were answered. Then he was instructed to lie on the couch in the sound-proof room and rest for five minutes. Before allowing him to rest, the third left digit was placed in the previously prepared plaster cast, the cast resting in the specially prepared holder already described. The pneumograph was attached. The electrodes were fastened to his right wrist, and the shock was adjusted so that it was preferably not painful but mildly unpleasant. The room was darkened and remained so for the remainder of the procedure.

B. Unstimulated Period:

At the termination of the five minute rest period, the experimenter notified the subject that the experiment was going to begin. One minute after this, recording was started. A record was taken for at least three minutes, during which time no stimuli were presented. Except for a few instances when the experimenter felt on the basis of plethysmographic irregularities that the subject needed

a rest, once recording was begun it was continued without a stop, and no one entered the subject's room until the end of the session.

C. Control Period:

1. The subject was stimulated at least 10 times with the conditioned stimulus (light) alone—or as many more times as was required for any strong response to be extinguished. An interval of between one to four minutes was allowed to elapse between stimuli, depending on when the recordings indicated that the vascular reaction produced by the stimuli had terminated.

2. The subject was stimulated twice with the unconditioned stimulus (shock) alone.

D. Training Period:

The subject was presented with twelve reinforcements during each of the first two sessions, for preliminary experiments indicated that this number is usually sufficient to establish some degree of conditioning, and more reinforcements were undesirable because they made each session too long—the sessions lasted between 30 and 45 minutes.

The response to the light was tested three times during this period, the order of presentation of stimuli being as follows: L (light) and S (shock), 3 times—L alone, once—L and S, 5 times—L alone, once—L and S, 4 times—L alone, once. The interval between stimuli was always varied to preclude the development of temporal conditioned responses (12, p. 45).

Second Session

A. Unstimulated Period:

Similar to the same period in Session One.

B. Training Period:

The patient was given reinforcements among which three presentations of the conditioned stimulus alone were made according to the following order: L and S, 4 times—L alone, once—L and S, 3 times—L alone, once—L and S, 5 times—L alone, once.

Third Session

A. Unstimulated Period:

Similar to the same period in Session One.

B. Extinction Period:

The subject was stimulated with the conditioned stimulus alone 20 to 30 times in 30 to 45 minutes.

Question Period:

At the end of each session the subject was asked a series of questions and the replies were noted down. The gist of the questions asked was as follows:

1. Did you become sleepy or restless at any time during the session? Do you think you fell asleep or missed any stimuli? Do you remember how many light and shock combinations were presented? How many times the light stimulus alone was presented? The shock stimulus alone? Did the stimuli feel any weaker or stronger as the session progressed?
2. What were you thinking about during the session? Were you preoccupied or worried about anything? Did you at any time try to enhance or inhibit your reactions to any of the stimuli? If so, do you think you were successful in enhancing or inhibiting your reactions?
3. Do you have any idea what the purpose of this experiment is?

At some time during the experiment the subject was asked whether he ever regularly had any of the following possible symptoms of autonomic imbalance: constipation, diarrhea, flushing, palpitation, cold extremities, cyanosed extremities, dyspnea, urticaria, hay fever, asthma. Likewise, any of the following signs were looked for: hyperhidrosis, pallor, sinus, arrhythmia, cold extremities, cyanosed extremities, tremor, asthenic habitus.

RESULTS

The results are summarized in Table I and figure 1 and are reviewed in the discussion.

DISCUSSION OF RESULTS

First Session

A. Rest Period:

Plethysmograms were taken from time to time during this period, although the subject was under the impression that he was not being observed. In general, these plethysmograms indicated that the peripheral vessels tended to be in a more tonic state at the beginning of the rest period and gradually

relaxed towards the termination of this period; pulse volume gradually tended to increase, and the amplitude of spontaneous changes in total volume of respiratory waves tended for the most part to increase, although the differences were small. The tendency toward an increased amplitude of respiratory waves with arteriolar relaxation has been described by others (15).

B. Unstimulated Period:

The plethysmograms taken during this period, and all subsequent ones, were analyzed for respiratory waves, third order waves, and any irregularities that might be present. The findings have been incorporated in Table I, as have other findings of any possible significance.

Subjects No. 8 and No. 10 were interesting in that the plethysmogram of No. 8 showed periodic deep inspirations followed by marked vasoconstriction, while No. 10's showed frequent, irregularly spaced, extrasystoles apparently unrelated to respiration or to the stimuli presented in subsequent periods.

C. Control Period:

1. Presentation of the Conditioned Stimulus (Light) Alone:

During the presentation of the light alone, ten or more times in succession, there tended to be less change in pulse and total volume as the number of presentations of the light alone increased; in other words, there occurred some extinction of the response to the light stimulus that was present before the actual training period began.

In general, the responses in each subject to the conditioned stimulus before reinforcement differed in the following ways from those obtained after reinforcement:

- (a) The latent period between the moment of presentation of the stimulus and the onset of the response was longer.
- (b) The responses were qualitatively more variable, showing increased total volume at one time and decreased total volume the next time, and changes in pulse volume did not so frequently tend to parallel changes in total volume as they did after reinforcement.

(c) Averages of groups of five successive stimulations indicated that the magnitude of total volume and pulse volume changes in either direction tended to decrease to almost zero very rapidly, and the average magnitude of changes in all but a few subjects was never at any time as marked before reinforcement as it was after reinforcement.

The average magnitude of the total volume change during the last five presentations of the conditioned stimulus at the time of the control period showed that 5 of the subjects actually tended to have a predominance of an increased total volume following stimulation; whereas, the typical conditioned vascular response was always in the direction of decreased total volume. Some significance may be attached to the fact that four of these subjects, Nos. 1, 2, 3, and 4, constituted the group of those who appeared to have the greatest degree of conditioning, and at the beginning of the control period they all showed relatively great responses to the light in the direction of an increased total volume. As will be indicated later, their vascular reactions consistently appeared characterized by more lability than those of the other subjects. The other member of this group of 5 who showed an increased total volume to the conditioned stimulus alone during the latter part of the control period was subject No. 6, who belonged to the group of those who appeared to have a moderate, but substantial degree of conditioning.

2. Presentation of the Shock Stimulus Alone:

The presentation of the shock stimulus during the control period, for the purpose of demonstrating whether or not it was adequate in producing some kind of vascular reaction, produced in every subject, except one, No. 5, a reaction that can be interpreted as a vasoconstriction, *i. e.*, a decrease in total and pulse volume (and a relatively constant heart rate). In subject No. 5, whereas a slight decrease in pulse volume occurred after both electric shock stimuli, a decreased total volume occurred after the first shock and an increased total volume followed the second shock; this discrepancy appears to be associated with the fact that there was no ob-

vious change in heart rate after the first stimulus but for some reason the heart rate accelerated 4 beats per minute after the second stimulus. On the other hand, variations in heart rate of this small degree usually had no obvious associated effects on the plethysmogram, so that venous stasis or contractility may have been a factor involved, a factor more prominent in this subject than others. This subject (No. 5) showed a moderate degree of conditioning in spite of relatively frequent erratic responses of this type from time to time during the experiment.

D. Training Period:

Salient features of vasomotor conditioning are enumerated and briefly discussed below and are illustrated in the sample graphs under figure 1.

1. Changes in total and pulse volume tended to parallel one another in every subject during every session, *e. g.*, a decreased total volume was accompanied most of the time by a decreased pulse volume and vice versa.

2. Curves describing the course of conditioning were drawn by plotting changes in magnitude of the total and pulse volume against trials of presentation of the conditioned stimulus during the first two sessions, which included the two training periods. (See figure 1.) These curves did not always follow the usual type of learning curve. Other investigators have made the same observation in studies on the positive salivary conditioned responses (2). Hilgard and Marquis state that most conditioning curves show a double inflection, being at first accelerated and later decelerated. They recognize that conditioning may vary in speed from the type which is established in a single trial to that which is established only after hundreds of trials (12). Four subjects, Nos. 1, 2, 4, and 5 had conditioning curves which indicate an increasing magnitude or frequency of the conditioned response with increasing reinforcement. The other subjects showed conditioning curves in which there was little change in the magnitude of the conditioned response or a temporary increase followed by an actual decrease during reinforcement.

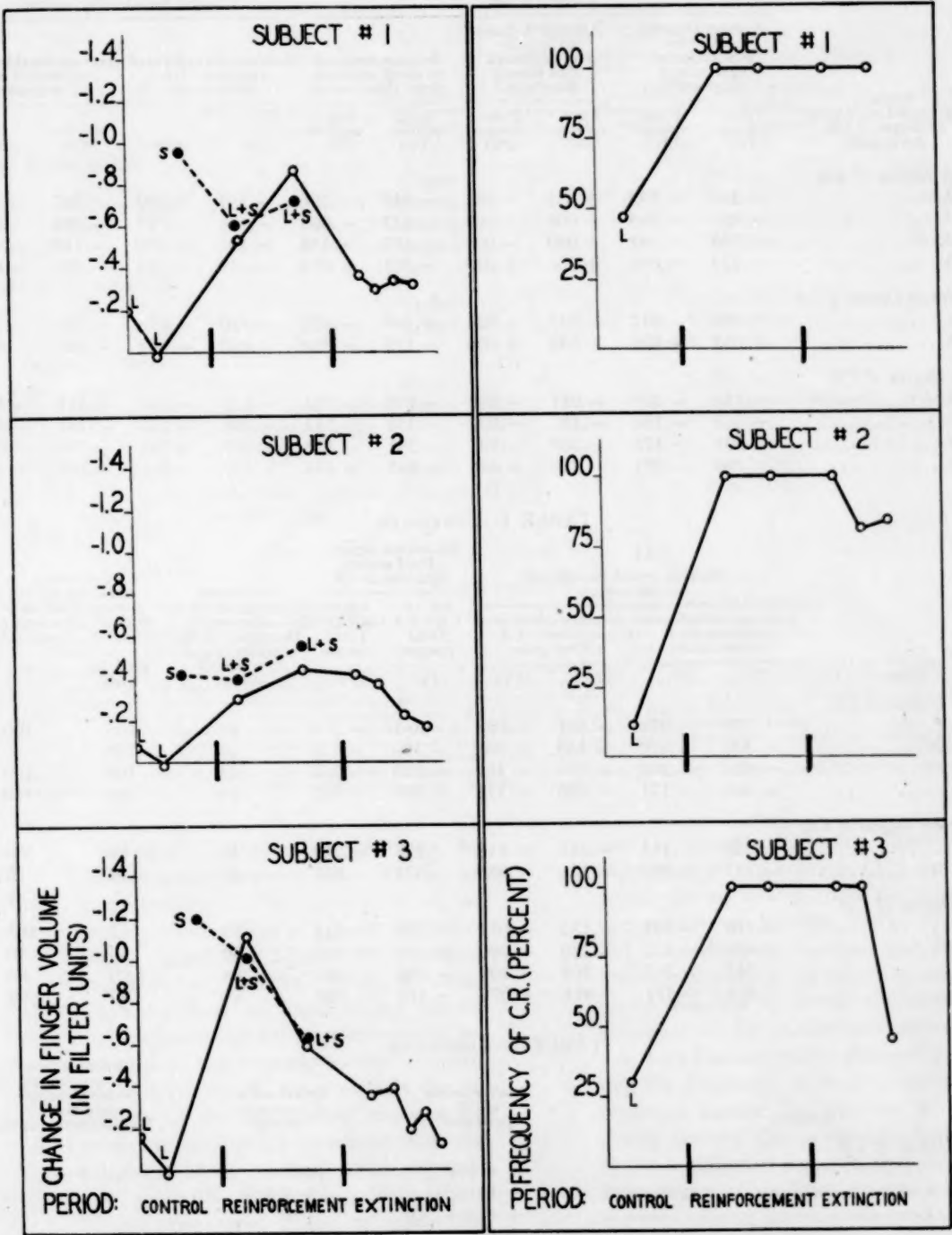


FIG. 1. Sample curves of conditioning.

S = response following electric shock stimulus alone. L = response following light stimulus alone. L + S = response following light with shock stimulus (unconditioned response). All other points on curve not lettered indicate level of response after light stimulus alone—following reinforcement (conditioned response).

TABLE I

Subjects (Grouped according to degree of CR developed)	Control period						Training period—first session			
	Average response to first five non-reinforced light stimuli (filter units)		Average response to last five non-reinforced light stimuli (filter units)		Average response to shock stimulus alone (filter units)		Average unconditioned response—UR (filter units)		Average conditioned response—CR (filter units)	
	Total volume (TV)	Pulse volume (PV)	Total volume (TV)	Pulse volume (PV)	Total volume (TV)	Pulse volume (PV)	(TV)	(PV)	(TV)	(PV)
<i>High Degree of CR</i>										
1.....	-.193	-.053	+.025	-.021	-.948	-.106	-.591	-.093	-.567	-.108
2.....	-.065	-.003	+.008	+.009	-.421	-.063	-.414	-.037	-.295	-.039
3.....	-.155	-.038	+.060	-.008	-.119	-.158	-.107	-.190	-.110	-.211
4.....	-.124	-.018	+.006	+.023	-.221	-.059	-.219	-.062	-.206	-.079
<i>Moderate Degree of CR</i>										
5.....	+.098	-.017	-.043	-.024	+.103	-.024	-.120	-.076	-.224	-.085
6.....	+.053	+.008	+.035	+.006	-.155	-.058	-.150	-.062	-.091	-.049
<i>Low Degree of CR</i>										
7.....	-.174	-.100	-.017	-.069	-.130	-.087	-.473	-.144	-.314	-.144
8.....	-.263	-.104	-.183	-.030	-.358	-.152	-.489	-.170	-.384	-.134
9.....	-.408	-.178	-.169	-.101	-.391	-.158	-.273	-.145	-.208	-.092
10.....	-.268	-.091	-.216	-.044	-.801	-.204	-.489	-.161	-.202	-.102

TABLE I—CONTINUED

Subjects	Training period (continued) second session				Extinction period— third session Stability of CR		Percentage frequency of responses to the conditioning stimulus during the control period	Percentage frequency of CR's during extinction— 20 trials, all presented within 20-30 minutes	
	Average unconditioned response—UR (filter units)		Average conditioned response—CR (filter units)		Av. of CR's 1-5 Total volume	Av. of CR'S 15-20 Total volume		First 10 trials	Last 10 trials
	(TV)	(PV)	(TV)	(PV)	(TV)	(TV)			
<i>High Degree of CR</i>									
1.....	-.739	-.078	-.881	-.088	-.361	-.273	50	100	100
2.....	-.515	-.070	-.430	-.068	-.396	-.155	10	100	80
3.....	-.633	-.203	-.599	-.184	-.305	-.263	33	100	100
4.....	-.408	-.171	-.450	-.173	-.105	-.552	10	100	100
<i>Moderate Degree of CR</i>									
5.....	-.205	-.113	-.215	-.118	-.277	-.219	10	80	100
6.....	-.311	-.100	-.126	-.086	-.324	-.057	20	100	70
<i>Low Degree of CR</i>									
7.....	-.270	-.131	-.133	-.087	-.054	-.212	80	65	100
8.....	-.629	-.177	-.220	-.090	+.160	-.104	80	30	40
9.....	-.242	-.163	-.163	-.109	-.388	-.182	88	90	80
10.....	-.874	-.171	-.416	-.078	-.316	-.054	55	80	90

TABLE I—CONTINUED

Subjects	Relative Degree of CR Developed	Relative freq. of respiratory waves	Relative freq. of spontaneous volume changes (third order or Traube-Hering waves)
<i>High Degree of CR</i>			
1.....	++++	+	+++
2.....	+++	++++	++
3.....	++++	++	++
4.....	++++	++	++
<i>Moderate Degree of CR</i>			
5.....	++	++	++
6.....	++	+	++
<i>Low Degree of CR</i>			
7.....	+	+	++
8.....	+	++	+
9.....	0 to +	+	+
10.....	+ to ++	++	+

TABLE I—CONTINUED

Subjects	Misc. findings in the plethysmograms	Manifestations of autonomic imbalance	Correlation of reported intensity of sensation with measured intensity of concomitant vascular changes		Effect of voluntary inhibition of responses	Insight into experiment
			Positive (Agreement)	Negative (Disagreement)		
<i>High Degree of CR</i>						
1.....	Absent	0	1	<i>No apparent effect</i>	.....
2.....	Present	1	1	Not tried	Obtained
3.....	Present	0	1	<i>Apparent inhibition</i>	.....
4.....	Present	2	1	Not tried	Obtained
<i>Moderate Degree of CR</i>						
5.....	Absent	1	1	Not tried	.....
6.....	Absent	1	1	Not tried	.....
<i>Low Degree of CR</i>						
7.....	Absent	0	2	Not tried	.....
8.....	Periodic deep inspiration followed by vasoconstriction	Absent	2	3	<i>Apparent inhibition</i>	Obtained
9.....	Absent	1	1	Not tried	.....
10.....	Freq., not regular extrasystoles	Present (?)	1	1	Not tried	.....
			9	13		

KEY TO TABLE I

CR = conditioned response.
UR = unconditioned response.
TV = total volume.
PV = pulse volume.

— (minus sign) indicates a decrease in pulse or total volume.
+ (plus sign) indicates an increase in pulse or total volume.

* *Filter Units*: One problem in the use of the photo-electric plethysmograph was calibration. The method used in this experiment was that devised by Hertzman and Dillon (8) who have shown that some degree of quantitation can be obtained by sliding into place between the photo-cell and the transilluminated skin a glass filter, which absorbs a constant fraction of light reaching the photo-cell and produces a downward deflection of the recording taken through the resistance-coupled amplifier. The amount of deflection of the tracing varies directly as the intensity of illumination and as the amount of amplification, but since the intensity of illumination remains constant, the amount of deflection is a direct measure of the intensity of amplification. By measuring the deflections produced by inserting the filter in millimeters, and dividing this figure into the measured amplitude of the pulse volume and the change in total volume as obtained from the plethysmogram, these particular variables in the plethysmogram are converted into arbitrary units, *i. e.*, filter units, which allow quantitative comparison of records taken on different days and on different subjects.

3. Curves illustrating the course of the unconditioned response were drawn by plotting changes in the magnitude of the total and pulse volume against reinforcements (figure 1). These curves showed unpredictable changes, although somewhat less than the conditioning curves, and indicated the not-often-mentioned instability of the response to the unconditioned stimulus. In some subjects the instability of the conditioned response appeared to be directly correlated with the instability of the unconditioned response, *e. g.*, subject No. 3. And in subjects whose conditioning curve tended to follow the typical curve (subjects Nos. 1, 2, 4, and 5), the increasing magnitude of the conditioned response often tended to follow closely a previously increasing unconditioned response.

Hilgard and Marquis point out that the conditioned and unconditioned response

may be qualitatively quite different in some types of conditioning (12), but they do not discuss at any length the quantitative parallelism between the conditioned and unconditioned response, and the importance of plotting curves of the unconditioned response to better appreciate the variations in the conditioned response.

4. Conditioning curves obtained by plotting the *frequency* of positive conditioned responses against the number of trials, giving thereby the percentage frequency of the conditioned response, indicated that some degree of conditioning was achieved in every subject; whereas, the conditioning curves obtained by plotting *magnitude* of pulse and total volume changes against trials suggested a questionable degree of conditioning in one or two subjects. The former curves were more regular and showed less variations than the latter curves.

5. Four subjects showed a relatively high degree of conditioned responses, two showed a moderate degree, and four showed a low degree, as judged on the basis of the magnitude and the frequency of the conditioned responses. These relationships are summarized in Table I.

6. As will be indicated later, certain changes in attitude and emotional set of the subject seemed to be related to deviations of the conditioning curves from the typical curve of learning in several subjects. Other investigators have also demonstrated positive effects of emotional and similar factors on vasomotor reactions and peripheral blood flow (1, 3, 4, 14, 17, 22).

7. Respiratory and third order waves in the plethysmograms did not appear to be significantly different in amplitude or frequency in subjects conditioned easily or with difficulty.

8. The average latency of all conditioned vascular responses did not appear to vary significantly in different subjects. It ranged between 3.5-4.5 seconds.

E. Extinction Period:

The extinction of these conditioned vascular responses is illustrated in the curves in figure 1 and included in Table I under the heading "The Stability of the Conditioned Response during the Extinction Period." The resistance to extinction was taken into consideration to infer the relative strength of conditioning in the different subjects (20, 21).

The analysis of results indicates that the conditioned vasomotor response, once it is established, appears to be a relatively stable one, considering the total reinforcements given and the rate of eliciting the conditioned response.

Other features of extinction of this response may be listed:

1. The conditioned response actually increased rather than decreased in two subjects (No. 7 and No. 8) during the course of the extinction period; however, in both of these subjects the level of the conditioned response was lower at the beginning of the extinction period than at either one of the previous sessions. An analysis of this apparent failure of extinc-

tion in these two subjects is beyond the scope of this study.

2. In general, rapid conditioners proved to be slow extinguishers, and slow conditioners, rapid extinguishers. All four subjects who were relatively highly conditioned, No. 1, No. 2, No. 3, No. 4, showed a relatively stable conditioned response during extinction, a possible exception being subject No. 2. Certain subjects, No. 5, No. 7, No. 9, who were less rapidly conditioned, showed relatively stable conditioned responses during this period too.

3. Two subjects, No. 8 and No. 9, showed rapid reconditioning when the conditioned response was reinforced one time during the latter part of the extinction period. Razran cites investigators who have made this observation in other kinds of conditioning (19, p. 277).

F. Question Period:

The question period was of aid in revealing missed stimuli, defects in apparatus (especially faulty light or shock stimuli), and other artefacts. But this period was meant to be of special value in pointing out whenever possible the effect of certain attitudes that the subject might voluntarily adopt towards the degree of conditioning or to indicate any possible cause-and-effect relationships between the subject's feelings and the course of his conditioning. Since no attempt was made on the part of the experimenter to predispose the subject toward any definite attitude to the experiment, his feelings were for the most part subjectively determined. The results are summarized below and indicated in Table I:

1. There was no positive correlation between the recorded relative degree of response to the conditioned and unconditioned stimuli and the subjective evaluation of the relative intensities of the sensations associated with these stimuli. In the twenty-two instances that the subjects did make comments regarding their sensations, only in nine instances did the impression agree with the plethysmographic results and in thirteen instances the impression was incorrect. One can conclude that these subjects, in general, did not have much success in judging the

relative intensities of their autonomic responses.

2. Three subjects attained insight into the fact that this experiment involved conditioning and this insight was obtained before the experimental procedure was finished. All three of these subjects had at one time studied some psychology. Each one obtained insight at a different time during the experiment, No. 4 and No. 8 some time during the first session, and No. 2 during the third session. Two subjects, No. 2 and No. 4, who attained insight were among those who developed a high degree of conditioning. The other subject, No. 8, developed a relatively low degree of conditioning.

3. Three subjects reported at some time during the procedure that they voluntarily attempted to inhibit their conditioned and unconditioned responses. No other subjects reported trying to do the same, although they were asked at the end of each session whether or not they had. Two subjects, No. 1 and No. 3, who attempted voluntary inhibition of their responses were among those relatively highly conditioned; and one appeared to be successful and the other did not. Another subject, No. 8, was among those who showed a relatively low degree of conditioning—and incidentally was one of the three subjects who gained insight into the experiment—and he appeared to be successful in inhibiting his reactions during the extinction period, apparently to such an extent that most of his vascular reactions were in the direction of vasodilation instead of vasoconstriction at this time. Certainly from these three examples no general principle can be drawn, but one might be safe in saying that these instances suggest that some subjects may be able voluntarily to alter the character of their vascular or autonomic responses.

4. Three subjects talked about some preoccupation or worry:

Subject No. 7, a college student, after the first session, talked about homework he had yet to do that evening and mentioned apprehensively a school examination the next day. His conditioned responses were of relatively high degree during the first session. But instead of being higher the

second session, they were lower. He admitted being worried about examinations he had taken that day and felt he had done poorly. He was also preoccupied with thoughts of social activities following the second session. During the third session (extinction period) the conditioned responses increased in magnitude. He mentioned no worries or preoccupations after this session.

Subject No. 3 also was worrying about examinations and his conditioned responses fell from a very high level obtained during the first session to a progressively lower level during the second and third sessions. He, furthermore, reported trying to suppress his responses to all stimuli during the last two sessions.

Subject No. 2 had a very regular course of conditioning, with conditioned responses increasing in magnitude as reinforcements were given during the first two sessions. He reported being "tense" throughout the first session and not preoccupied. He said he felt "relaxed" after the second session, although he had been in an auto accident with his parents on the way to this session and though no one was injured, all were "severely shaken."

One certainly cannot say that the degree of the conditioning was altered by the emotional set of the subject on the basis of three superficial and incomplete studies. All one can definitely say is that the last subject's, No. 2's, conditioning did not seem to be decreased but was apparently enhanced by having an auto accident on the way to a session, and the absence of the typical course of conditioning in subjects No. 3 and No. 7 may or may not have been related in some way to their feelings about examinations or to other conditions. Emotional factors need not necessarily inhibit conditioned responses and one investigation has reported that an apparent increase in the magnitude of a conditioned response may be associated with an emotion (22). Pavlov, too, recognized that in certain types of dogs, the excitable type (choleric), the development of conflict led to an increased reactivity to stimuli; whereas in other types of dogs, inhibitable type (melancholic), strain produced a decreased reactivity to external stimuli (18). Perhaps these three subjects fall into different characteristic groups, and their responses are quite typical of particular types.

The Relation of Signs and Symptoms of Vasomotor Instability to the Degree of Conditioning Obtained in each Subject

The results are interesting in that they indicate that subjects who show signs and symptoms of autonomic imbalance tend to become more easily conditioned. Three of the subjects, No. 2, No. 3, and No. 4, belonging to the group of four subjects who developed a high degree of conditioning, had some manifestation of autonomic imbalance. Subject No. 2's feet and hands became cold easily, sometimes when the room temperature was average (70-72°F) and sometimes when he was excited. Subject No. 3, of asthenic habitus, had palpitation, ready flushing of face, allergic reactions to many foods and pollens with a recent history of asthma and hay fever. Subject No. 4, also of asthenic habitus, had cold extremities, hyperhidrosis, occasional dizzy spells when lying in a dark room. Another subject, No. 10, who was in the group showing a low degree of conditioning, had questionable manifestations of autonomic imbalance—frequent extra-systoles and history of urticaria as a child.

SUMMARY

1. The vasomotor system of 4 of 10 subjects was conditioned rapidly to a light stimulus. A faradic current was used as the unconditioned stimulus and the vascular reactions were measured by means of the photo-electric plethysmograph. Once obtained this conditioned response appeared to be relatively stable.

2. Conditioning and extinction curves of this type of conditioning did not always follow the typical curves of learning and forgetting. The irregularity of the curves may be attributed to:

(a) The instability of the unconditioned responses in some subjects.

(b) Changes in attitude and emotional set of the subject.

(c) Other factors not studied in this experiment.

3. Three subjects who manifested signs and symptoms of autonomic nervous system imbalance were more easily conditioned than subjects who did not.

4. Subjects who were relatively easily conditioned showed more rapid and complete elimination of incidental vascular reflexes to the light stimulus, and showed a tendency toward more stable conditioned responses during extinction than subjects who were not easily conditioned.

5. The intensity of sensations as reported by subject was not a valid indication of the magnitude of the physiological vascular reactions concomitant with these sensations.

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NARCOLEPSY AS A PSYCHOGENIC SYMPTOM*

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The causative factors in narcolepsy remain obscure but are usually considered to result from organic brain disease, such as encephalitis, neoplasm and trauma, or to be associated with hysteria, and finally are evasively called cryptogenic. The latter term indicates the difficulty in determining the etiology and pathology of many narcolepsies. In this paper the term is used to mean uncontrollable attacks of sleep.

The literature contains few reports of the psychiatric treatment of attacks of compulsive somnolence—*i.e.*, narcolepsy. Further, the possibility of such an approach would be excluded by Thiele (9) and Adie (1), and even recently in 1941 by Gill (5) who deny any possible connection between narcolepsy and psychogenic motivation. However, Wilson, whose work on this subject is outstanding, protests against undue narrowing of the concept of narcolepsy. He insists that "it is impossible to draw a hard and fast rule between short and long sleep or, for that matter, between somnolence and trance" (10).

A review of the literature discloses few reports of cases of narcolepsy in which some psychological data is presented. Missriegler (7) reports the case of a young man who submitted to sexual contacts with his foster mother from childhood. The author indicates that the narcoleptic attacks were etiologically associated with conflicts occasioned by this early sexual behavior. Brock and Wiesel (3) report a case of a 48-year-old female who became sick at the age of 42, and who experienced attacks of sleep lasting from minutes to hours. She admitted having had sexual relations with her father during adolescence. During the narcoleptic attacks she had dreams of a sexual nature, some of them sufficiently vivid to produce orgasms. Since the first presentation of our case, Langworthy and Betz (6) have reported a number of cases in which they view narcolepsy as a "personality reaction to an emotional issue." They consider narcolepsy a disease rather than a syndrome and regard its etiology as entirely psychogenic.

Cases of narcolepsy studied over a long period of time in a hospital are so rare that a detailed

report of this, a single case, seems warranted. The patient, who falls in the infrequently studied group of hysterical narcolepsies, afforded an unusual opportunity while under hospital observation for the study of the interrelations of various narcoleptiform states. These consisted of variations from the waking state and included periods of diurnal drowsiness, brief periods of compulsive sleep, and periods of sleep lasting as long as thirty-six hours. Frequently associated with these pathological sleep states, but also occurring independently of them, were hypnagogic hallucinations, cataplexy and polydipsia.

Of specific interest are the following features: (1) During the year's stay in the hospital, until the psychogenic nature of her illness became apparent, the physical signs seemed sufficient to throw the preponderance of opinion in favor of some organic lesion, such as tumor of the brain or encephalitis which have from time to time been accepted as one of the causes of narcolepsy. (2) The psychological conflicts of the patient did not become apparent under hypnosis; the first clues to them were indicated through terror dreams. No improvement was observed until confessional catharsis occurred. This was encouraged by the psychiatrist who appreciated the implications of the consciously reported experiences and dreams of the patient. (3) It developed that a long standing sexual conflict was closely related to the patient's states of sleepiness and other physical symptoms.

ANAMNESIS

The case concerns a 49-year-old German housewife admitted to Hospital C in October 1940, who had suffered for slightly over a year from attacks of uncontrollable states of sleepiness. They had begun suddenly on July 3, 1939 with an episode of sleep that lasted thirty-six hours. Since then she had been subject to frequent periods of pathological sleep which made the normal course of her life impossible.

The patient's father was 75 years old at the time of her admission and was beginning to suffer from senile deterioration. The mother, 72 years old, suffered from hypertensive cardiovascular disease. The rest of the patient's family history was essentially negative. She married a Pole at the age of

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nineteen and had two daughters who were happily married. Her previous medical history, aside from children's diseases, consisted only of a minor operation for the removal of pigmented nevi.

Symptoms associated with her present trouble began at least twelve years before admission to Hospital C, with attacks of headaches and vomiting for which she had been under treatment by numerous doctors in Mount Vernon where she resided at that time. Eventually she was referred to a specialist who sent her to Hospital A for observation. Subsequently she was admitted to Hospital B, and then readmitted to Hospital A and again to Hospital B in 1939. In each of these hospitals the possibility of brain tumor and encephalitis was under consideration. She slept for thirty-six hours on her first admission to Hospital B and was saved from an operation for brain tumor because of a negative encephalogram. From November, 1939 to October, 1940 she remained at home, most of the time bedridden because of continuous vomiting. During part of this time she was tube fed and had frequent intravenous injections of glucose but lost forty pounds in weight. She continued to suffer from attacks of uncontrollable sleep. In such an attack she was taken directly to Hospital C in October, 1940.

On admission to Hospital C the patient looked fatigued but not acutely ill. Her examination revealed the following: dragging of the right foot while walking; coarse, irregular tremor of outstretched hands, right more than left; right hemiparesis; right-sided hyposensitivity for all forms of sensation with a mid-line distribution; right hyposmia; diminution of hearing on the right side. Over the skin of the trunk many pigmented lesions were present. It was eventually agreed that all of the above neurological signs were hysterical. However, opinions were divided as to whether the patient had an hysterical sleep disturbance, a narcolepsy either cryptogenic or on an encephalitic basis, or due to a tumor in the neighborhood of the third ventricle. The latter possibility was, to some extent, favored because of the many pigmented nevi which had been considered as indicative of neurofibromatosis and because of a polydipsia to be described presently.

HOSPITAL OBSERVATION

On the ward the patient was usually well behaved and performed odd jobs with efficiency. She was well liked and managed to attain approval through an ingratiating passivity which was especially noticeable in her contacts with those in

authority. Even with her fellow patients she was never observed to stand up for her rights. On some days a marked alteration in behavior occurred and she would become dull, whining, sulky and childish. She then seemed on the verge of a tantrum and complained bitterly and endlessly about trivial things. At such times she differed from her usual self when she was considerate, exhibiting a culture and dignity above the average ward patient.

This change in personality and behavior were symptoms announcing the beginning of an alteration in the waking state which became evident in her facial expression and bearing. She would become pale, drawn and haggard, her face lined, her eyes glassy, eyelids drooping, and her movements generally slow. She expressed an overwhelming need to go to sleep.

During this period of drowsiness the hysterical conversion symptoms mentioned above became more pronounced; the patient would complain bitterly about them, whereas in her usual waking state these symptoms had to be elicited by questioning and examination. She would complain about weakness and numbness and strange prickling sensations in the right upper and lower extremities, a regular rhythmic tremor of the right hand would appear, and visual perception on the right would become less acute. Vomiting alternated with intense thirst for which the patient drank two to four quarts of fluid occurred during this period.

In describing the onset of a drowsy period the patient said: "It was like thunder and lightning together—I saw a flash—my head felt kind of funny—just like the sound of the waves in the ocean—in my throat on the right side as if something was drawing, closing up, choking—I couldn't do a thing with the right hand—it was heavy, I kept pinching it."

At times during the first few months in Hospital C, the patient recovered spontaneously from these drowsy states and became wide awake; more frequently the drowsiness would become intense and she would be put to bed. The degree of sleepiness which then ensued varied. Frequently states of quiet slumber appeared which differed in no way from normal sleep except through their involuntary nature and their inopportune nature. At other times the patient would toss her head and limbs in her sleep, would utter bits of phrases, her face would appear flushed and angry. Sometimes a state resembling normal sleep could represent the first part of an attack and then be followed by a restless state, or the opposite could also occur. Occasionally some of these attacks represented reliving of the past.

The duration of these states of sleepiness varied from minutes to many hours. The depth varied too. At times it would be possible to rouse her sufficiently for her to take a few sips of water—at other times this was impossible. The cessation of an attack of sleep was most often spontaneous and not brought about by any detectable stimulus. At times she could be forcibly awakened by shaking and then would stay awake. But usually this procedure met with no success—she appeared so sleepy and stupefied that it was necessary to permit her to continue sleeping till she awoke spontaneously. The termination of a sleep attack usually found the patient haggard, fatigued and miserable. No matter how long she had slept during such an attack she never appeared refreshed and several hours were needed, if the sleep attack had been a prolonged one, before she returned to her normal self.

This description of the alteration of her waking state is necessarily schematic and must be regarded merely as a composite picture of a succession of states of consciousness which were not always separated from each other in any very sharp way. In retrospect the essential features of the disturbance of sleep consisted in alterations of character and behavior, soon followed by a drowsy period, together with a group of conversion phenomena, then a quiet sleep or a disturbed sleep. Further, interspersed through any average day of the first year of hospitalization were brief episodes varying from a few seconds to two or three minutes of uncontrollable sleep.

The attacks of sleep appeared to occur spontaneously or were initiated by events whose nature and intensity were apparently not at all proportionate to the severity of the sleep attack. A visit from home during which she was informed that some one had a cold, a quarrel with a fellow patient, a reprimand from a nurse were typical of the events which were followed by attacks of sleep. The apparent spontaneity of the attacks or the trivial nature of the precipitating events indicated that the real etiology of her dramatic symptom was unknown.

A step toward the discovery of this etiology was made when it became possible for her physician to initiate attacks of sleep by introducing for her consideration certain distressing topics which investigation had revealed to have played a significant rôle in her life. These occurrences she had never told anyone, and during the first part of her stay in the hospital she had tenaciously opposed every attempt on her physician's part to elicit information on the suppressed aspects of her life. This information was obtained only through insistent inter-

rogation in conversational form. When questioning was pressed or significant suggestions were offered to her an increasing tension took place. Then she would cry, mutter ejaculations such as "oh, mamma," or "I deserve this" (indicating that she felt that she was being punished) and would pull her hair and rub her eyes violently. As the questioning continued, she manifested increasing excitation by fiercely scratching her right arm and right breast and also at times the area of the external genitals. This scratching was rhythmic and often her right arm and breast remained lacerated. When this point had been reached her actions were uncontrolled and she was in a dissociated state.

Finally as the emotional tension reached a still greater pitch and brought with it the exacerbation of the conversion symptoms, signs of drowsiness suddenly appeared in the midst of excitement. With continued interrogation the drowsiness became very pronounced and the patient would request permission to lie down for a few minutes and would succumb to sleep. It can be seen that one could experimentally reproduce the spontaneous sequence of events: characterological changes, exacerbation of conversion symptoms and then narcolepsy.

It was not only possible to initiate attacks of sleep but at times also possible to abort an impending attack provided the attempt was made before she became too drowsy. While the patient was still only moderately sleepy she would be urged, with considerable insistence, to tell what she was thinking about. Then, when she would not suppress but would relate material of some secret nature, an astonishing transformation would become evident in her in a few minutes. The sleepy expression would vanish completely, her eyes would become bright, her voice, manner and general bearing alert, and she would look as if she had awakened from a refreshing sleep.

LABORATORY STUDIES

The only exceptional laboratory finding both in and out of the hospital was a constant lymphocytosis ranging from 40 to 50 per cent. This is a frequent finding in narcoleptic patients. The basal metabolism was determined under the various states previously described and was always normal. The electroencephalogram in the waking state was normal except for a moderate slowing of the alpha frequency. It was also taken during an attack of profound sleep but showed no significant alteration.

PSYCHOSEXUAL HISTORY

One day toward the end of her first year in the hospital she voluntarily reported, under extreme tension and evident anguish, the following dream:

I was tied down on a couch with a rope and was forced to have intercourse. Had to have it twice, struggled and kicked. Don't know with whom.

The hints provided by this dream made it possible to uncover a complicated, prolonged sexual entanglement which began at the age of 12½ and lasted until the onset of her illness. After this hitherto unsuspected element of her sexual life had been discussed, the patient became visibly calmer, she had fewer attacks of narcolepsy and her nocturnal insomnia diminished.

The violent person alluded to in the above dream was eventually described as a large, masculine, aggressive person (Mr. E.). Sexual relations with him had been relatively satisfactory and she acknowledged an ease and freedom in her relations with E., which had never existed with her husband.

A picture of her true relations to her husband gradually unfolded and proved quite contradictory to that obtained in the formal history. Life with him had been a monotonous routine in which he devoted himself to her as well as he could and she accepted this devotion as her natural due. Sexuality with him had always been on what she considered a respectable but perfunctory basis. Moreover, her husband was inferior to her in formal schooling and in his interests. Spiritually she had more in common with her lover and she felt intellectually stimulated by him.

However the improvement resulting from the catharsis noted above was relatively shortlived. The patient again succumbed to many sleep attacks, became easily upset, complained bitterly about fancied insults on the ward and it was surmised that she had not yet divulged much important data. After about two months, under tremendous tension she finally related a story of sexual contacts with her father which began at the age of six and continued until the onset of her illness, forty-two years later.

A clue to the patient's extraordinary early sexual experiences came from words uttered in an emotional outburst:

When my mother left the house I would scream, stamp with my feet, have hysterics, hold on to her dress . . . I was afraid of my father . . . yet he loves me . . . he still says I am his favorite.

Gradually and in detail, the patient described sexual attacks by her father. They always assumed

the same pattern of pursuit, forced submission and ejaculation intrafemora till the age of 12½, when she first experienced complete sexual intercourse with him. The essential pattern of this scene of terrifying rape was repeated uniformly in those sexual contacts which later became acceptable to the patient with her lover.

Apparently for a few years after her first experience with her father, the feeling of terror persisted but at about the age of 9 or 10 more open curiosity, active interest, less fright in connection with sexual activity and a jealousy of her mother began to develop. Thus, during childhood, she repeatedly attempted to satisfy her curiosity as to the nature of her father's practices with her mother by secret observation. In later years she showed her jealousy by questioning her father as to the extent of his enjoyment of intercourse with the mother, for the father's relations with the mother and daughter were concurrent over forty years.

At about 14 she seduced a boy of 18 (Mr. E.), hoping to achieve with him one of her aims—namely, normal intercourse. Although she did not attain this immediately, she and her lover became so compatible that the relationship continued for 34 years—until the onset of her narcolepsy. There seems little doubt that she and her lover would have been married when she was 19, had it not been for the active interference of her father who probably suspected that the lover had become his rival.

At the age of 19 she married her husband, but throughout her married life, and as previously related, continued sexual activity with her father and with her lover. Her attitude toward these three men is indicated by her remarks: "When I was having intercourse with my husband I would think of these two men. They were both so violent and passionate."

The account of her long endured suffering came out in fragments and disclosed that the above conflict resulted in a conditioning of the patient to violence in sexuality of which an intimation came through her first terror dream. This was later confirmed by many remarks made when the patient labored under intense emotional excitement. The continued need in many of the patient's reactions for masochistic suffering in sexuality began in early childhood, and so gripped her that she was compelled to continue the illicit relationship with her father and lover. This relationship seems to have been so distressing that it might well have caused splitting headaches (*i. e.*, migrainous attacks), and nauseated (caused vomiting) any person with sensitivity. With the patient's mental unburdening in the

hospital all her symptoms began to be not only less frequent but also less severe so that after her discharge from the hospital only three attacks of transient narcolepsy occurred to the time of this report (over 3 years).

TREATMENT

Treatment was first directed toward a determination of the nature of the amnesia for her attacks of narcolepsy since it was felt that a reconstruction of her memories of these attacks would provide valuable material for favorably influencing them. Under suggestion the patient fell rapidly into a deep hypnotic state and her general physical appearance under hypnosis formed a striking contrast to her usual anxious and harassed look. Her features became calm and relaxed, her breathing regular and easy and her body tension vanished. Under hypnosis she established a recall for some of the thought content experienced during her sleep periods.

During the first year of treatment at Hospital C hypnosis, interestingly enough, apart from recovering previously forgotten memories failed to reveal clues which might explain the psychodynamics of her condition. Nevertheless the nature of her memories indicated that a psychological basis for the attacks existed and led to the hope that if this psychological causality could be established the attacks might disappear. Her dreams continued to be principally terror dreams of the death of members of her family but her associations to the dreams were meager. Her conscious memories and explanations were not helpful.

After some of the amnesic gaps had been filled and the diagnosis of psychogenic narcolepsy appeared certain, hypnosis was abandoned. The hypnotic procedure had the effect of making the patient place even greater responsibility for her care on the physician; she showed an increased indifference to any need for attempting to understand her problems and in general exhibited a lack of concern for her grave condition. It was therefore felt that from a therapeutic viewpoint hypnosis, with its basic submission to the physician's authority was contraindicated because it seemed to foster submissive and dissociative tendencies already apparent in the patient. A strong emotional dependence upon her physician continued after hypnosis was discontinued.

After hypnosis had been abandoned the psychotherapeutic treatment was directed toward eliciting those facts of her life which have been recorded above. Most of this information was obtained by

direct questioning. During this phase of treatment it was not a matter of helping the patient recover forgotten memories but of persuading her to relate material that she had sworn to take to the grave, as the patient had said. For somewhat less than 2 years the struggle against the patient's obstinate reluctance to give important information continued, but she surrendered the data in spite of herself.

During this cathartic treatment the patient's drowsiness served as a valuable indicator of the extent to which she was unburdening herself. If drowsiness did not disappear during the session her physician knew that important material was being withheld. The similarity in this effect of unburdening to Freud's early case of Elizabeth von R. is striking. His patient had as her leading conversion symptom a hyperalgesia of the right thigh. This area would lose much of its painfulness when the patient related significant material, and Freud writes that he used the fluctuations of this conversion symptom as a guide. He says, "Whenever she became mute but still claimed to have pains, I knew she had not told me everything and urged her to continue the confession until the pain was 'spoken away.' Then only did I awaken a new recollection" (2).

After the patient was no longer in the hospital, the psychoanalytic approach was adopted with the physician abandoning his rôle of active probing during her visits to his office twice a week. The rationale behind this change was based on two considerations. First, it became evident that truly unconscious material might be responsible for the conversion symptoms and occasional drowsiness still present and this could not be recalled through voluntary effort on the patient's part. Second, the passivity of the patient could best be combated by passivity on the part of the physician, and she was so informed. The most important result of this change in therapy was that the patient began to manifest a more active interest in her own cure and an increased interest in the psychodynamics of her past and present life. The result of this new attitude brought no immediate satisfactions to her. Quite the contrary—it released a profound sense of guilt which harassed her and it compelled her to work through, painful though it was, her psychosexual involvements. It also brought with it a change in character, for an aggressiveness hitherto repressed and converted into masochistic attitudes now made its appearance.

The patient's attitude toward the physician, however, continued to be one of apparent docility and

excessive gratitude. But this did not deter her from a healthy regard for her own interests.

PRESENT STATUS

At the time of this report, the patient had been at home for 3 years under the care of one of us (L. A. S.) who was seeing her twice weekly during this time. She had had three sleep attacks and several drowsy spells. The one sleep attack followed the death of her father a year after her discharge from the hospital, the others signalized her marriage anniversary and the anniversary of the death of her lover. The drowsy spells occurred, just as in the hospital, as precursors to new and significant memories. For the past year narcolepsy had been absent completely. The right sided conversion symptoms as well as the polydipsia continued to fluctuate in relation to the material she was bringing forth. Her nocturnal sleep had in general been poor although there were increasingly frequent periods of improvement. Her sexual relations with her husband continued to be as perfunctory and as unsatisfying as ever.

Despite the occasional recurrence of symptoms the overall impression was one of substantial improvement. With regard to her leading symptom, the sleep attacks, it was now possible for her to talk about her incestuous relationship without signs of drowsiness. Her lapses into narcolepsy were replaced by conscious affect disturbances and she came to regard her original illness not only as punishment but also as an unconscious effort at restoration. She said, "How could I have done these things? I must have been asleep all my life. If I wouldn't have fallen asleep I never would have woken up to my duties in life."

She took up a fairly active social life and was apparently interested in her housework. Her former pleasure in self-sacrifice was replaced by complaints about the hardships of her daily household tasks.

COMMENTS

Obviously no attempt could be made to obtain outside corroboration of the patient's life story without endangering her security and therefore such an attempt was not undertaken.* However we believe its main elements to be true and to be

* Two years after her discharge from the hospital when she was in a quiet frame of mind, she was seen twice by the second author who, independently, obtained the same consistent life history from the patient and which she related with the appropriate affects of grief and regret.

free of any attempt on the part of the patient to justify herself, to defend her actions or to make herself important as the heroine of a lurid tale. The patient spent an entire year in the hospital before she began to release the unsavory details of her life's history. The important facts in her story were not eagerly blurted out by the patient as sometimes occurs with hysterical persons or pathological liars, but, on the contrary, only under insistent urging and with many physical evidences of intense anguish, loathing, and revulsion. The pathological liar relates his fabrications with ease, with pleasure, and without persuasion and hesitancy such as our patient showed. Furthermore the patient's reliability in all other fields is certain and in the five years of steady work with her no important inconsistencies in her story were ever elicited.

The mechanism of falling asleep to evade difficult situations is well known, so much so that some of our patients have referred to their long hours of sleep as serving the same purpose as a narcotic drug. Oberndorf (8) reported a case of uncontrollable attacks of drowsiness which were interpreted as an escape from an intense sense of shame attendant upon a masturbation conflict in which fantasies of incest with the mother played an important rôle (2). The drowsy spells at the same time provided a substitute for the autoerotic activity.

Oberndorf also has under treatment at the present time a patient who falls promptly and soundly asleep when topics involving incestuous thoughts about his mother, which he consciously experienced in childhood, come up during the analytic hour. It is of interest to note that this patient also suffers from periods of depersonalization which symptom serves the function of removing and protecting the patient from threats which to him were the equivalent of death. In the above two cases, and we think also in the one we are reporting, the function of the attacks of sleep is to allay a sense of guilt.

In our patient's case no strong conscious feeling of guilt manifested itself until her conversion symptoms and the somnolence were beginning to disappear. The narcolepsy was in a sense an exaggeration of the "belle indifférence" which was characteristic of the patient's approach to her life problems.

The awareness of guilt and the attacks of narcolepsy seem to have been reciprocally antagonistic to each other. No connection existed in the patient's mind as to the possible relationship of her symptom of nausea with rejection and revulsion, of her headaches with punishment and suffering,

nor of her uncontrollable sleep with an escape from the sense of guilt. When the narcolepsy vanished the patient for the first time became dissatisfied with her familial situation and was conscious of a sense of guilt in a way that she had never experienced before. All evidence pointed to the interpretation of the narcolepsy as being both a punishment and an indulgence for the patient.

We have already pointed out in this case these three features; (1) that attacks of narcolepsy could be induced in the patient regularly by a guilt laden topic—incest; (2) the same procedure could induce conversion symptoms; (3) both the narcolepsy and the conversion symptoms could be diminished and eventually even aborted by the cathartic method of therapy. The observation that the same agent which produced conversion symptoms (or brought about their pronounced exacerbation) could also be used to induce a narcoleptic attack and that the process (catharsis) which dissipated or alleviated these conversion symptoms could also abort an impending attack of sleep leads one of us (L. A. S.) to consider the need for suggesting a similarity between the narcolepsy and the hysterical conversion symptoms. The further observation that in the experimentally produced attacks of narcolepsy a rigorous sequence of characterological changes, conversion symptoms and finally sleep regularly occurred suggests that the narcolepsy and the somatic hysterical symptoms were both produced by the same mechanism, conversion. It appears that the mobilization of incestuous wishes in this patient first manifested itself in circumscribed conversion symptoms, but when these proved inadequate to master the increasing excitation, a narcoleptic attack then supervened to accomplish this task. In accordance with Freud's definition that "in conversion hysteria the instinctual cathexis of the repressed idea is transformed into the innervation necessary for the symptom" (4), it appears possible to consider the hysterical symptoms of this patient and her narcolepsy as graded expressions of the same instinctual cathexis, the incestuous wish; and both appear to employ the same mechanism, conversion.

The relationships between normal sleep and narcolepsy will not be discussed here but one of us (L. A. S.) suggests that in the initiation of normal sleep, conversion may also function to bind the excess free energy resulting from the retraction of ego cathexes which occurs with the onset of normal sleep. One of us (L. A. S.) hopes to investigate some of the pathological phenomena occurring

in the transition from the waking state to sleep from the point of view of conversion mechanisms.

In the progress of treatment it will be recalled that almost no symptomatic improvement occurred in the patient through hypnosis and hypnotic suggestion. Cathartic abreaction—discharge of pent up emotion—seemed to account almost entirely for the relief of the more prominent symptoms after clues as to the nature of her illness became clear from her utterances under hypnosis and from her terror dreams. This was the method originally employed by Freud before he became concerned with the phenomenon of resistance and resorted to the involved technique of psychoanalysis.

No psychoanalytic interpretations of her symptoms were offered to the patient by the physician (L. A. S.) while in the hospital and only sparingly since her discharge from it. The rôle, in the sense of transference, which he played during the entire therapeutic procedure, is not very clear to us. Most likely he was regarded as a forgiving father but also as a father who punished her by eliciting from her an acknowledgment of infidelity. In this rôle he probably eased the acceptance by the patient of a conscious sense of guilt and eliminated the necessity for her former unconscious physical conversion and escapes. Finally, the thought must be raised whether recovery would have been more rapid and complete had the therapist seen the patient more frequently both while she was in the hospital and outside, and had he used a deeper psychoanalytic technique. However, this much can be said—good results were achieved under the conditions reported.

SUMMARY

1. A case is presented for the purpose of demonstrating unusual psychogenic factors in a case of narcolepsy.
2. Catharsis, in the sense of disclosing memories both forgotten and voluntarily withheld, appeared to have been effective in relieving the patient of her main symptom, narcolepsy.
3. Based on these findings, psychogenic narcolepsy is interpreted as a means of unconscious satisfying forbidden wishes without experiencing conscious guilt and simultaneously as a punishment for these wishes. The disappearance of the narcolepsy through psychotherapy induced a conscious sense of guilt.
4. One of the authors (L. A. S.) suggests that the mechanism of conversion which is responsible for the hysterical symptoms of functional hemiparesis and functional vomiting is likewise responsible for the narcolepsy.

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AN ANALYSIS OF THE INFLUENCE OF ALCOHOL ON EXPERIMENTAL NEUROSES IN CATS *

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In a preliminary communication (9, 10) we reported that alcohol, when administered to cats in doses of from 0.5 to 2.0 cc. per kilo, disorganized learned adaptive patterns and thereby greatly modified the complex aberrations of behavior characteristic of experimental neuroses. It is our present purpose to report an extension of these studies and to validate their results by a detailed statistical analysis of the experimental data.

RATIONALE AND TECHNIQUE OF THE EXPERIMENTS ¹

Effects of Alcohol on Normal Behavior: In an automatic apparatus designed to facilitate accurate experimental observation, 21 cats were trained to open a box for a pellet of food ² two seconds after a bell-light signal. When the animal had learned to respond to signals (S) given by the operator, it was further taught in successive stages (a) to operate an electric switch that actuated the signals and feeder (Sw), (b) to reach this switch when it was placed horizontally behind a movable barrier (SwB) and, finally, (c) when the switch was hung vertically on the distal wall of the apparatus (SwV) (see fig. 1). After such individual training, the animals were paired until one became "dominant"; i.e., responded promptly to the feeding signals while its "submissive" partner no longer attempted to feed as long as the dominant animal was present (7). The animals were then given alcohol by mouth or by intraperitoneal injection in various doses in order to study the effects of the drug on their feeding responses, dominance relationships, reactions to mice and other patterns of behavior as listed in Table I.

Effects of Alcohol on Neurotic Behavior: Following this control period of study the animals

were subjected to a blast of air or a mild condenser shock at several irregularly spaced feedings, thus inducing a motivational conflict between "conditioned" hunger and fear (4, 9, 10). Under such circumstances the animals developed feeding inhibitions, startle and phobic responses to sound and light stimuli, loss of group dominance, aversive behavior to various configurative elements (e.g., signals, food, experimenter) previously associated with the conflictful situation and other "neurotic" behavior patterns as coded in Table I. When these aberrations had been made sufficiently specific and stable by occasional reinforcement of the conflict, the animal was again given alcohol and the effects of the drug observed and analyzed as previously. Finally, the animals were permitted a free choice between plain foods (pellets or milk) and those with a 5% admixture of alcohol in order to determine whether the neurotic animals, as contrasted with normal controls, had developed a significant preference for the drug.

RESULTS

For purposes of objective presentation the experimental data of this study have been assembled into 19 tables, the significance of which may be analyzed statistically and inferentially as follows:

Control Observations: The initial characteristics of our animals are summarized in Table II.

Columns 1 and 2 list the weight of our 21 experimental animals as one index of their initial nutritional state and show no significant difference in the mean weight of our 11 males and 10 females.

Columns 3 to 13 of Table II summarize outstanding characteristics of the experimental animals as recorded daily by all observers ³ during the period of training in the feeding-response situation. The first six of these columns (X's) denote the spontaneous behavior of the animals, and the last five (numerals) refer to their reactions in the experimental situation as listed in paragraphs A to E of Table I. In general it may be seen that the four animals (Nos. 6, 9, 12 and 14) that were initially resistive or combative in some degree showed correspondingly adverse reactions to the learning situa-

³ The authors and two laboratory assistants, Mary R. Nicholson and S. Lee.

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¹ The details of the experimental techniques employed in our laboratory have been more fully described by Masserman (4), and illustrated in a series of motion pictures, (3, 5, 7, 9) and (11).

² The standard food reward was a pellet rolled from granulated Purina dog food, dry Brewer's yeast, liver extract, canned salmon and whole milk. Each animal was permitted forty runs daily, but was not fed between experimental sessions except when given a test choice thrice daily between plain milk and milk containing 5% alcohol (vi).

TABLE I

SYSTEM OF NUMERICAL RATINGS OF EXPERIMENTAL OBSERVATIONS *

A: Attraction to Apparatus

- 0 Violently resists entry to cage
- 1 Agitated and hyperesthetic in cage
- 2 Restless; paces; seeks release
- 3 Immobile; crouches in corner
- 4 Indifferent to entry or confinement
- 5 Readily seeks to enter and remain

B: Escape Behavior

- 0 Energetically tries to force escape
- 1 Invariably leaves cage when permitted
- 2 May leave or remain when door open
- 3 Indifferent to escape
- 4 Remains despite inducement to leave
- 5 Actively resists removal from cage

C: Reactions to Food Box

- 0 Violently resists approach to box
- 1 Crouches in far corner
- 2 Avoids immediate vicinity of box
- 3 Desultory in signal response
- 4 Opens box on 4/5 of signals
- 5 Avidly opens and explores box on signal

D: Attraction to Caged Mice

- 0 Avoids or phobic to mice
- 1 Indifferent to mice
- 2 Occasional desultory observation
- 3 Interested but readily distracted
- 4 Watches intently
- 5 Active attempts to capture

E: Reaction to the Experimenter

- 0 Active resistance to all handling
- 1 Selective hostilities
- 2 Indifferent; avoids handling
- 3 Tolerant but unresponsive
- 4 Friendly, but not spontaneous
- 5 Actively seeks handling and petting

F: Initial Inter-animal Conflict

- 0 None; peaceful relationships
- 1 Occasional shouldering for food
- 2 Persistent competition for food
- 3 Snarling, arching, threats
- 4 Occasional overt fighting
- 5 Persistent, vicious combat

G: Neurotic Food Avoidance

- 0 Feeds freely on pellets
- 1 Erratically or fish only
- 2 From box only when guided
- 3 Hand feeding only
- 4 Special food only
- 5 Rejects all food

H: Neurotic Switch Avoidance

- 0 Works switch spontaneously
- 1 Works spontaneously with guidance
- 2 Use irregular or sporadic
- 3 Hesitant and incomplete
- 4 Will not use switch
- 5 Shows active avoidance

I: Neurotic Hypersensitivity

- 0 Response focussed on feeding situation
- 1 Alert but not distractible
- 2 Overt-alert, distractible
- 3 Occasional generalized startle
- 4 Frequent generalized startle
- 5 Marked phobias; crouching, panic

J: Neurotic Reaction to Signal

- 0 No fear of signal
- 1 Slight startle
- 2 Occasional fear (startle, crouching)
- 3 Occasional fear, maximal
- 4 Consistent fear, submaximal
- 5 Consistent fear, maximal

K: Situational Retreat

- 0 Passes barrier only for switch
- 1 No preferred position in cage
- 2 Prefers rear; emerges for signal
- 3 Remains in rear unless guided
- 4 Resists guidance around barrier
- 5 Persistent attempts to escape

L: Fear of Constriction

- 0 None, feeds on signal
- 1 Slight restlessness but feeds
- 2 Leaves food at barrier movements
- 3 Ignores signal when constricted
- 4 Phobic reactions with increased constriction
- 5 Panic reaction when constricted

M: Neurotic Motor Disturbance

- 0 None
- (1) Hyperactive 1 Hypoactive
- (3) Compulsive 3 Immobile
- (5) Convulsions 5 Catalepsy

N: Autonomic Changes

- 0 None grossly observed
- 1 Horripilation, mydriasis
- 3 Trembling, tachycardia, irregular breathing, salivation, retching
- 5 Vomiting, urination, defecation

O: Substitutive Behavior

- 0 None
- 1 Preening, playing, rubbing
- 3 Deviant responses (Specify: prolonged switch pressing, excessive clawing, pacing, rituals, etc.)
- 5 Persistent bizarre responses (specify)

P: Loss of Inter-cat Dominance

- 0 Maintained dominance
- 1 Occasional (< 20%) surrender of food
- 2 Frequent (> 80%) surrender of food
- 3 Mild phobic responses; fighting
- 4 Avoidance of subdominant partner
- 5 Signal-phobia; immobility; catalepsy

Q: Narcosis (based on motor coordination)

- 0 No motor symptom
- 1 Hyperactive
- 2 Retardation
- 3 Moderate disturbance of coordination
- 4 Marked disturbances of equilibrium
- 5 Stuporous

* These ratings are convenient for comparative purposes, but are not to be considered regular gradations of specific variables in a behavioral continuum.

TABLE II
BEHAVIOR CHARACTERISTICS OF ANIMALS WITH NORMAL FEEDING RESPONSES

1	2	3	4	5	6	7	8	9	10	11	12	13
General Characteristics before Training												
Animal No.	Sex	Weight in K. ²	Slow	Restive	Active	Aggressive	Combative	Friendly	(A) ¹ Apparatus	(B) ¹ Escape	(C) ¹ Food box	(D) ¹ Mice
1	M	1.9	..	..	X ³	X	..	..	5	5	5	4
2	M	2.5	..	..	X	..	..	X	5	5	5	5
3	F	2.3	X	..	..	..	..	X	5	4	5	3
4	F	2.0	..	..	X	..	..	X	5	5	5	4
5	M	2.5	..	..	X	X	..	X	5	4	5	5
6	M	1.9	X	X	..	..	X	..	4	4	4	5
7	F	1.9	..	..	X	..	..	X	4	4	5	4
8	F	1.9	..	..	X	..	..	X	4	4	5	4
9	M	2.2	..	..	X	X	X	..	4	4	5	2
10	M	1.8	..	..	X	..	..	X	4	4	5	1
11	F	1.6	X	..	..	..	..	X	4	4	5	2
12	F	1.6	..	..	..	X	X	..	4	4	5	3
13	M	2.7	..	..	X	X	..	..	5	5	5	2
14	M	2.5	..	..	X	..	..	..	4	4	5	1
15	M	2.3	..	..	X	X	..	..	5	4	5	3
16	F	2.3	..	..	X	..	..	X	4	3	4	1
17	F	2.4	X	..	..	..	..	X	3	3	4	1
18	M	1.5	X	..	..	..	..	X	1	4	4	0
19	M	2.6	..	X	..	..	X	..	4	4	5	5
20	F	1.8	X	X	..	..	..	..	2	3	3	2
21	F	2.0	..	..	X	..	..	X	3	3	5	3

¹ (A), (B), etc. refer to the mean of behavior ratings in the experimental apparatus as listed in Table I.

² Mean weight of males, 2.22 K.; of females, 1.98 K. Difference not statistically significant.

³ X refers to the presence in a specific animal of the general behavioral characteristic listed at the head of the column.

tion; however, after further training nearly all the animals eagerly entered the apparatus, resisted removal and readily passed barriers in all positions to operate the switch for the proper signal and ensuing reward of food. If the switch was removed, the animals watched the experimenter's movements through the glass walls of the cage and often dashed toward the food box in anticipation of a feeding signal whenever the experimenter began to approach the controls outside the cage. When satiated, the animals explored the apparatus, tried to reach a white mouse protected by a small cage,

or sought the experimenter's attention for play or petting. In effect, the animal's activity at this stage of the experiment was preponderantly well-integrated, goal-directed and efficient, and contrasted markedly with the neurotic behavior to be described below.

Training in the Feeding Response: Table III lists the number of days of 40 trials each required by our animals to learn the progressive skills necessary in the feeding-situation, starting with simple signal response (S) and proceeding through switch manipulation (SW), passage of the barrier to reach

TABLE III
NUMBER OF DAYS REQUIRED FOR SUCCESSIVE STAGES OF STANDARD TRAINING IN THE FEEDING SITUATION

Animal No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	Mean
(S)																						
Signal Response.....	2	1	2	1	1	2	1	2	1	1	2	1	3	2	2	2	2	2	2	1	2	1.67
(SW)																						
Switch Manipulation	2	3	2	2	2	2	3	3	2	3	2	3	1	3	2	1	2	..	3	..	..	2.20
(SwB.)																						
Switch behind barrier	2	2	2	2	2	1	2	1	2	2	1	1	1	1	3	2	3	..	3	..	..	1.83
(SwV.)																						
Switch vertical.....	..	..	..	..	3	2	3	3	3	3	3	2	3	1	2	2	3	..	4	..	..	2.60

the switch (SwB) and finally, operation of the switch when hung vertically (SwV) or in other difficult positions in remote portions of the apparatus. Perhaps the most significant inference to be drawn from an inspection of this table is that apparently normal animals under standard conditions vary greatly in what Tolman (13) has called their apperceptive-discriminative-manipulative capacities, and that the same animal may show widely different abilities in the various sensori-motor vectors of a required performance (12).

The range of probability by chance (P) is between .05 and 0.1; ergo, the male animals in our group tended to be heavier than the females, but not to a statistically significant degree.

B. Relation of Weight to Dominance or Passivity: Using the same form of analysis applied to the difference between the weights of dominant animals and those of their submissive partners $t=0.881$; d. f.=6, and P ranges between 0.4 and 0.5. Consequently, there was no significant relationship

TABLE IV
DATA ON DOMINANCE-PASSIVITY

1	2	3	4	5	6	7	8	9
Pair	Animal No.	Sex	Weight in kilos	D or P	Total No. of days	No. of days to D or P	Total No. of trials	Rating on fighting (averages)
I	1	M	1.9	D	7	7	140	5
	2	M	2.5	P	7	7	140	4
II	3	F	2.3	D	9	7	180	2
	4	F	2.0	P	9	7	180	5
III	5	M	2.5	D	8	7	160	3
	6	M	1.9	P	8	7	160	5
IV	7	F	1.9	D	10	7	200	3
	8	F	1.9	P	10	7	200	1
V	9	M	2.2	D	10	7	200	2
	10	M	1.8	P	10	7	200	3
VI	11	F	1.6	D	7	7	140	4
	12	F	1.6	P	7	7	140	1
VII	13	M	2.7	D	7	7	140	2
	14	M	2.5	P	7	7	140	5

Dominance and Passivity: In Table IV are listed the observations of the dominance relationships of the animals when paired by sex and approximate weight and then allowed to compete for the food reward after each signal or switch-manipulation. As may be seen in the last column of the Table these animals proved somewhat more pugnacious in such competitions than a similar group previously studied (7, 8), yet in only two of the pairs (I and III) were the initial combats at all severe, and in all except pair I the fighting diminished rapidly as the dominance of one of the animals was clearly established; *i. e.*, when after a week of 20 paired runs daily, the passive animal no longer attempted to secure the food on signal while the dominant one was present. Specific statistical analyses⁴ of the data in Table V were made as follows:

A. Sex Differences in Weight:

Mean weight of 8 males (\bar{x}_m) = 2.250 K.

Mean weight of 6 females (\bar{x}_f) = 1.883 K.

$$t = \frac{\bar{x}_m - \bar{x}_f}{\text{standard error of the difference}} = 2.156,$$

Degree of freedom (d. f.) = 12.

⁴ For the rationale and mathematics employed, see Fisher (1).

between weight and dominance in our paired animals.

C. Correlation Between Weight and Ratings on Combativeity (Table I, F): $r=0.033$; d. f.=12; again, the relationship is not significant.

D. Sex Differences in Relation to Combativeity: $\bar{x}_m=3.625$; $\bar{x}_f=2.667$; $t=1.224$; d. f.=12; $P=0.2$ to 0.3. The differences are not significant.

E. Dominance-Passivity in Relation to Ratings on Combativeity: The mean of the combativeity ratings of dominant animals minus those of their passive partners is 0.429; $t=0.465$; d. f.=6; $P=0.6$ to 0.7. Again, the difference in relation to its critical ratio is not significant.

These analyses, then, confirm the conclusion of a previous study, namely that dominance in the paired feeding situation is not significantly related to the sex, weight, or combativeity of the animal, but to less tangible characteristics such as alertness to the signals, immediate goal-orientation, and speed and persistence in securing the reward directly, rather than deviously by fighting with a competing animal.

EFFECTS OF ALCOHOL ON NORMAL BEHAVIOR

Tables V and VI present the changes in the patterns of learned behavior produced in experimental animals by various doses of alcohol, either by the injection of a 10% solution in Ringer's fluid intraperitoneally or by the administration of a 5% to 10% solution in milk by mouth or by stomach tube. A comparative inspection of these tables will reveal the following:

1. Alcohol injected intraperitoneally induced a more rapid and more prolonged impairment and

mice placed within the experimental apparatus (Column 8).

3. More significantly, alcoholic intoxication disorganized complex adaptations such as passage of barriers or difficult switch-manipulations to a greater degree than it affected simpler patterns, such as reactions to signals given by the operator or direct feeding from the box. (Cf. Column 5.) Correspondingly, the latter responses were the first to reappear as the animal emerged from the intoxication and gradually recovered its capacities for

TABLE V
EFFECTS OF THE INTRAPERITONEAL INJECTION OF 10% ALCOHOL IN RINGER'S SOLUTION

1	2	3	4	5				6	7	8	9
Animal No.	Wt. in kilos	Dominant or passive	No. of trials	Minutes to abolish				Relative stupor in minutes	Effect on D or P	Loss of response to mice	Recovery time in minutes
				SwV ¹	SwB ¹	Sw ¹	S ¹				
1 cc. alcohol per kilo											
1	2.1	D	1	2	4 ²	V	V	0	0	-1	100
5	2.6	D	2	8	12	V	V	5 ³	0	-3	85
6	2.4	P	1	V	V	V	V	0	0	-2	90
1.25 cc. alcohol per kilo											
4	2.4	P	2	..	V	V	V	0	0	-4	165
1.5 cc. alcohol per kilo											
1	2.1	D	1	..	V	V	V	0	0	-1	135
2	2.6	P	1	..	V	V	V	0	0	-1	85
3	2.2	D	1	..	10	V	V	0	0	-1	190
4	2.4	P	1	..	5	V	V	0	0	-4	210
5	2.6	D	1	8	13	18	25	15	-4	-4	215
6	2.4	P	1	3	5	8	V	0	0	-4	115
1.75 cc. alcohol per kilo											
1	2.1	D	1	..	7	7	7	5	0	-4	180
2	2.6	P	1	..	5	V	V	0	0	-2	120
2 cc. alcohol per kilo											
1	1.9	D	1	..	5	8	15	8	0	-4	270
2	2.3	P	1	..	5	7	V	0	0	-2	210

¹ The figures under SwV represent the time in minutes after the administration of alcohol until the animal lost the capacity to manipulate the switch in a difficult position (e.g., hanging vertically); SwB denotes inability to operate the switch behind a barrier; Sw means the loss of capacity to operate the signal-switch; S signifies the loss of response to simple feeding signals given by the operator. (See Rationale and Technique.)

² V means that the activity listed was abolished by the alcohol in an indeterminate time.

³ With eructations and vomiting.

disorganization of activity than corresponding doses given enterally in milk.⁵

2. With only one exception (animal 5), alcoholic intoxication of sub-stuporous degree did not alter the dominance status of our animals (Column 7). Occasionally a mildly intoxicated passive animal would make a few abortive attempts to pre-empt the food on signal, but these ceased as the dominant partner re-asserted its position. On the other hand, alcoholic intoxication induced a consistent diminution in the pursuit of, or apparent interest in, caged

higher-order adaptations. Nevertheless, as long as the effects of the drug lasted, the animal's behavior showed various degrees of repetitiousness, retardation, dysrhythmia, and general impairment of integration and goal-orientation at all levels of function (7).

4. Other relevant inferences may also be derived from the data as follows: The weight of the animal influenced the effects of alcohol in only one respect: with doses of more than 1.5 cc. per kilo, the larger animals tended to recover from the effects of intoxication more rapidly than those weighing less. When animals were given four or more doses of alcohol at 48-hour intervals, they occasionally acquired a

⁵ Haggard, Greenberg and Ralsieten (2) have shown that this may also be due to the specific effect of milk in retarding the rate of absorption of alcohol.

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slight degree of tolerance to its effects, but in no instance did a definite immunity to the drug develop. Significantly, no normal animal placed in a free choice situation showed any consistent signs of

have supplied more than one-fifth their daily caloric requirements (a maximum of 2.5 cm. of alcohol or 15 calories as opposed to a mean daily need of 80 calories per kilo),⁶ the possibility remained that

TABLE VI
EFFECTS OF 10% ALCOHOL IN MILK BY STOMACH TUBE¹

1	2	3	4	5	6				7	8	9
Animal No.	Weight in kilos	Dominant or passive	Per cent of alcohol in milk	No. of trials	SwW	Effects on SwB	Sw	S	Effect on D or P	Loss of response to mice	Recovery time in minutes
1 cc. alcohol per kilo											
8	1.9	P	5	1	V	V	V	V	0	-1	80
1.25 cc. alcohol per kilo											
16	2.5	NT	7	1	V	V	V	V	NT	0	60
1.5 cc. alcohol per kilo											
7	2.1	D	7	1	V	V	V	V	0	-1	95
8	1.9	P	7	1	NW	V	V	V	0	-2	130
13	2.5	D	7	2	V	V	V	V	0	0	50
14	2.5	P	7	1	V	V	V	V	0	0	75
17	2.6	NT	5	1	NW	V	V	V	NT	-1	50
1.75 cc. alcohol per kilo											
9	2.4	D	7	1	NW	V	V	V	0	-1	120
10	1.9	P	7	2	V	V	V	V	0	-2	120
15	2.4	NT	7	1	V	V	V	V	NT	-2	97
16	2.5	NT	7	2	V	V	V	V	NT	-2	90
19	2.8	NT	10	1	NW	V	V	V	NT	-1	90
2.00 cc. alcohol per kilo											
8	1.9	P	7	2	NW	V	V	V	0	-2	130
11	1.9	D	7	1	NW	NW	V	V	0	-1	120
12	1.6	P	7	1	NW	NW	V	V	0	-1	110
13	2.5	D	7	1	V	V	V	V	0	-1	90
15	2.4	NT	7	2	NW	NW	V	V	NT	-3	140
16	2.5	NT	7	2	NW	V	V	V	NT	-2	160
2.25 cc. alcohol per kilo											
19	2.8	NT	10	1	NW	NW	NW	V	NT	-5	150
2.5 cc. alcohol per kilo											
10	1.9	P	7	2	V	V	V	V	0	-2	175
13	2.5	D	7	1	NW	NW	V	V	0	-1	150
14	2.5	P	7	2	V	V	V	V	0	-2	130
15	2.3	NT	7	2	NW	NW	NW	V	NT	-5	200
17	2.6	NT	5	1	NW	NW	NW	V	NT	-5	120
2.75 cc. alcohol per kilo											
10	1.9	P	7	2	V	V	V	V	0	-2	210
13	2.3	D	7	2	NW	NW	NW	V	0	-4	170
14	2.5	P	7	2	NW	V	V	V	0	-4	210
3.0 cc. alcohol per kilo											
15	2.3	NT	7	1	NW	NW	NW	NW	NT	-5	300
16	2.3	NT	7	1	NW	NW	NW	V	NT	-5	300
19	2.6	NT	10	1	NW	NW	NW	NW	NT	-5	265
3.25 cc. alcohol per kilo											
10	1.8	P	10	1	NW	NW	NW	V	0	-4	260
14	2.4	P	7	2	NW	NW	NW	V	0	-5	255

¹ Abbreviations are the same as those in Table VII. In addition, NW means that the animal did not recover the corresponding activity despite the fact that at the end of the period listed in Column 9 it appeared fully normal as to motor coordination, signal-response, food-seeking, etc. NT denotes that the datum was not tested.

avidity for food or milk containing alcohol in preference to those with no admixture of the drug (Table VIII and text, v.i.).

Fluctuations in Weight: Despite the fact that the amount of alcohol given our animals could not

alcohol might have affected the hunger drive and so diminished the motivation of intoxicated animals

⁶ Unpublished data from a two-year investigation at Swift's Research Laboratory Kennels; courtesy of Dr. A. C. Merrick's personal communication.

to work the switch for food quite apart from any concurrent disintegration of their learned feeding patterns. This possibility was rendered less likely by repeated observations that the alcohol did not abolish direct food-taking unless stupor was actually induced, and by the fact that, insofar as hunger could be judged by body nutrition, animals given alcohol consistently lost weight. This is shown statistically by an analysis of Table VII, in which column 2 represents the mean daily weights of the animals during a control period of an average of three weeks of observation, column 3 represents

5. (a) Normal animals lost a significant amount of weight during a period of disintegration of behavior caused by the administration of alcohol, and (b) the loss was in part due to a disruption of complex feeding responses.

Alcohol Preference in Normal Animals: This was tested by presenting the animal with two dishes placed on a rotary stand, one containing plain milk and the other milk with 5% alcohol (figure 1, d). Three series of tests were made with the dishes in random positions at the beginning, middle and end of the daily run of the animal in the experimental

TABLE VII
EFFECTS OF TRAINING AND OF ALCOHOL ADMINISTRATION ON NORMAL ANIMALS

1 Animal No.	2 Mean control wt. in K.	3 After training	4 Difference 3-2	5 After alcohol intake	6 Difference 5-3
1	1.9	2.1	+0.2	1.8	-0.3
2	2.5	2.6	+0.1	2.2	-0.4
3	2.3	2.2	-0.1	2.3	+0.1
4	2.0	2.4	+0.4	2.4	0
5	2.5	2.6	+0.1	2.2	-0.4
6	1.9	2.4	+0.5	1.8 ¹	-0.6 ¹
7	1.9	2.1	+0.2	1.6 ¹	-0.5 ¹
8	1.9	1.9	0	2.0	+0.1
9	2.2	2.4	+0.2	2.4	0
10	1.8	1.9	+0.1	1.8	-0.1
11	1.6	1.9	+0.3	1.7	-0.2
12	1.6	1.6	0	1.6	0
13	2.7	2.5	-0.2	2.2	-0.3
14	2.5	2.5	0	2.3	-0.2
15	2.3	2.4	+0.1	2.1	-0.3
16	2.3	2.5	+0.2	2.3	-0.2
17	2.4	2.6	+0.2	2.4	-0.2
18	1.5	1.9	+0.4	.....	.....
19	2.6	2.8	+0.2	2.5	-0.3
20	1.8	1.8	0	.....	.....
21	2.0	2.1	+0.1	.....	.....
Mean	2.105	2.248	0.143	2.138	-0.169
Standard error	.....	.....	0.037	.....	0.042
t	.....	.....	3.865	.....	4.024

¹ Animals 6 and 7 contracted scabies during the period of alcohol administration. Because this disease and its treatment caused part of their excessive loss of weight, these animals were excluded from the calculation of columns 5 and 6 so as not to prejudice the analysis.

their mean weights after experimental training in the food-responses, and column 4 their weights at the end of the period of alcohol intake. As may be seen, the mean weight gain during training was 0.143 kilo with a standard error of 0.037. Since $t=3.865$ and for 20 degrees of freedom only one value in a hundred will exceed 2.845 by chance, the gain in weight during training is a statistically significant datum. Conversely, the mean loss of weight during the period of repeated alcoholic intoxications in 16 animals was 0.169 with 0.042 s.e. Since $t=4.024$, and in 15 d.f. only one value in 100 will exceed 2.947 by chance, the loss of weight is even more highly significant. It may therefore be concluded that:

apparatus, and the choice was recorded only when the animal showed definite preference either for plain milk or for the "milk cocktail." An analysis of the data summarized in Table VIII indicates that:

6. Normal cats repeatedly given alcohol by artificial means continue to show a highly stable preference for plain milk as opposed to milk with an admixture of alcohol. In other words, no instances of alcohol addiction developed in our control group of normal animals; on the contrary, several of them, through an associated aversion, began to reject even plain milk if other foods were available.

The Production of Experimental Neuroses: As previously indicated, experimental neuroses were produced in our animals by subjecting them to a

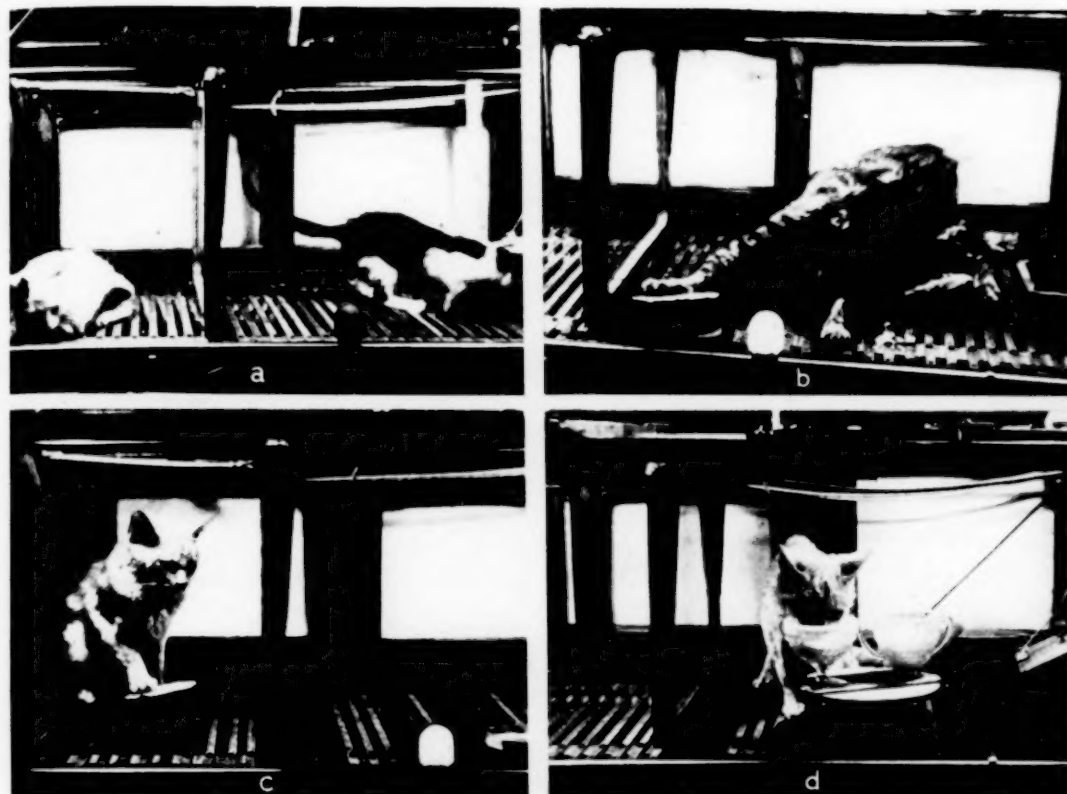


FIGURE 1. The effects of alcohol on neurotic aberrations of behavior

a) Neurotic feeding inhibitions, phobias, and loss of dominance: The white kitten on the left had been trained to feed at a bell signal and had then been made neurotic by the air-shock technique. She is here shown crouched in a far corner of the cage, pupils dilated, hair erect, in phobic reaction to a feeding signal. In contrast, her non-neurotic but previously submissive partner opens the food-box and feeds avidly at the same signal.

b) The animal shown had been made neurotic by the air-blast technique and had developed, among other aberrations, marked feeding inhibitions, aversions for the experimental situation, and phobic reactions to the switch and the signals. However, when given 1 cc. of alcohol per kilo, the animal once more began to work the switch and respond to the signals by feeding from the box, although its behavior patterns, particularly the more complex ones—were in general hesitant, repetitious, and poorly integrated, as in (c) below.

c) A neurotic but mildly intoxicated animal reaches and operates the switch even though it is placed behind a barrier away from the food-box. This animal, however, occasionally remained poised for long periods on the switch, without seeking the food-reward, or it repeated various segments of its previously well-learned feeding patterns in seemingly aimless fashion, or it sometimes endeavored to find food without antecedent signals. Nevertheless, this behavior, however disorganized it appeared to be under alcohol intoxication, was in marked contrast to the pervasive inhibitions and the phobic, startle and panic reactions that the animal ordinarily exhibited in its sober state.

d) A neurotic animal which had experienced relief of inhibitions and tensions during previous alcoholic intoxications, and which had subsequently been permitted free choice between alcoholic and non-alcoholic foods is here shown emptying a cocktail-shaped glass filled with 5% alcohol-milk in preference to a mug-shaped glass containing whole milk. As long as its neuroses persisted this animal showed a maintenance of this choice despite variations in hunger, positional changes of the containers on the rotary stand, and other control procedures described in the text.

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TABLE VIII
ALCOHOL PREFERENCE TESTS ON NORMAL CATS

1	2	3	4	5
Animal No.	No. of days	Average No. of choices per day		Difference 4-3
		Cocktail	Milk	
8	1	1.00	2.00	1.00
9	1	0	3.00	3.00
10	4	0.25	2.75	2.50
11	3	0	3.00	3.00
12	2	0.50	2.50	2.00
13	6	0.33	2.67	2.34
14	4	0	3.00	3.00
15	13	1.08	1.92	0.84
16	6	0.67	2.33	1.66
17	17	0.71	2.29	1.58
18	5	0.20	2.80	2.60
19	15	0.80	2.20	1.40
20	4	0.25	2.75	2.50
Mean	..	0.445	2.555	2.109
Standard error	..	.....	.....	0.209
t with 12 d. f.	..	.....	.....	10.091

mild (12-lb.) air-blast and a physically harmless condenser-shock at the moment of conditioned food-taking, thus inducing a motivational conflict which was reinforced by repeating the traumatic experience at irregular intervals. The degree of neurosis produced was then graded by multiple daily ratings of the animal on criteria A through P in Table I, and the difference between the unweighted over-all mean of these ratings subtracted from the respective means of the daily ratings that had been calculated when each animal was nor-

mal. These over-all differences then constituted an "index of neurotic change" as entered in column 6, Table IX.

An analysis of the neurotic indices in relation to the other data in the table reveals the following:

7. In conformity with previous observations, all animals subjected to the conflict-producing procedure became moderately to severely neurotic. Specifically, they developed (1) marked inhibitions of normal activity (cessation of spontaneous play and exploration as well as switch-manipulation,

TABLE IX
DATA ON EXPERIMENTAL NEUROSES

1 Animal No.	2 Conflictful traumata	3 No. of days	4 Range of frequency per day	5 Loss of weight in kilos	6 Index of neurosis ¹
1	9	7	2-1	4	-5
2	12	5	5-1	5	-5
3	10	8	3-1	4	-4
4	14	6	6-1	6	-4
5	13	5	4-1	5	-5
7 ²	8	5	4-1	3	-4
8	5	5	1	4	-4
9	5	4	2-1	5	-4
10	5	4	2-1	2	-4
11	9	5	5-1	2	-4
12	4	3	2-1	1	-4
13	7	6	2-1	3	-5
14	18	9	6-1	4	-5
15	4	3	2-1	2	-4
17	2	2	1	1	-4
18	2	2	1	4	-4
19	14	6	5-1	3	-5
20	1	1	1	3	-4
21	1	1	1	2	-4

¹ In effect, the ratings in Column 6 are ranged on a scale in which 0 represents no change, and -5 signifies the development of severe and persistent neurotic reactions as described on criteria A through P in Table I. In the statistical calculation, the minus signs have been omitted.

² Animal No. 6 died of an intercurrent infection before the observations were completed.

TABLE X
VALUES OF THE COEFFICIENTS OF CORRELATION OF THE VARIANTS IN THE PRODUCTION
OF EXPERIMENTAL NEUROSES IN 19 ANIMALS¹

	Loss of weight in kilos	No. of days necessary	Total No. of traumata necessary	Initial frequency of traumata	Rating of neurosis index
Loss of weight kilos.....	.....	.465	.550	.431	.310
No. days necessary.....	.465	.....	.852	.581	.552
Total no. times necessary.....	.550	.852	.....	.846	.653
Initial frequency.....	.431	.581	.846	.....	.655
Ratings on neurosis.....	.310	.552	.653	.655	.....

¹ For 17 degrees of freedom, the values of the correlation coefficients (*r*) for different levels of significance are: 0.389 for *p* = 0.10, 0.456 for *p* = 0.05; 0.59 for *p* = .02, and 0.575 for *p* = .01. As may be seen, nearly all the coefficients in this table are significant.

signal-response and food-seeking); (2) marked physiologic disturbances (startle reactions, hyperesthesia, mydriasis, tachycardia, gastro-intestinal dysfunctions) under circumstances related to the conflict; (3) aversions to the various configurations in the associative field ("phobias" of signals, switch, mice, restraint, handling by the experimenter) in or out of the neurotogenic situation; (4) loss of group dominance and (5) marked aberrations in gross motor behavior (compulsions, stereotypies or cataleptic rigidity) as described in detail in previous reports (3, 4).

8. For the group of 19 neurotic animals, the average number of air-shock combinations necessary to abolish feeding-responses on the first day was $2.789 \pm$ a standard deviation of 1.609. The mean total number of such traumata required to establish an experimental neurosis was 7.526 with 4.838 s. d., and a range at the upper end of the frequency of 2.789. The mean number of days

required was 4.579 with 2.160 s. d., at the end of which period the mean neurotic index for the group was 4.316 with 0.464 s. d.

During the period of induction of the experimental neurosis, the animals lost from 0.1 to 0.6 kilo in weight, with a mean of 0.332 and 0.137 standard deviation. Since $t=10.375$ and with 18 d. f. less than one chance value in 100 exceeds 2.878, this loss is statistically reliable and signifies consistent inhibition of the feeding response.

Statistical Intercorrelations: These are presented in Table X and reveal the following significant phenomena:

9. Specific feeding inhibitions (as measured by loss of body weight) are more highly correlated ($r=.550$) with the number of conflict-engendering traumata to the learned feeding response than with the concurrent development of the other neurotic aberrations rated in Table I ($r=0.310$). This datum is in line with previous observations that no

TABLE XI
CALCULATION OF THE REGRESSION LINE FOR THE LOSS OF WEIGHT IN KILOS ON THE TOTAL NUMBER
OF AIR-SHOCK TRAUMATA

Animal No.	Calculated values: Y	Experimental values: y	Values of x
1	0.36	0.4	9
2	0.40	0.5	12
3	0.37	0.4	10
4	0.44	0.6	14
5	0.42	0.5	13
7	0.34	0.3	8
8	0.29	0.4	5
9	0.29	0.5	5
10	0.29	0.2	5
11	0.36	0.2	9
12	0.28	0.1	4
13	0.32	0.3	7
14	0.50	0.4	18
15	0.28	0.2	4
17	0.24	0.1	2
18	0.24	0.4	2
19	0.44	0.3	14
20	0.23	0.3	1
21	0.23	0.2	1

matter how generalized, elaborate, or "symbolic" neurotic aberrations of conduct may become (v. i.), their leading characteristics (in this case, food-inhibitions) still tend to center about the specific patterns of behavior rendered directly conflictful.

10. Animals in which a relatively large number of traumata were necessary on the first day to abolish the feeding response also required a larger total number of traumata ($r=0.846$), and a longer

period of time ($r=0.581$) for the production of a stable neurosis. Such initially resistant animals, however, when subjected to consistent reinforcements of the conflictful situation finally became severely neurotic ($r=0.655$).

Regression Formulae: The scatter diagram (fig. 1, graph A, derived from Table XI) shows y as loss of weight in kilos (\bar{y} =mean) and x as the total number of air-shock traumata (\bar{x} =mean). This

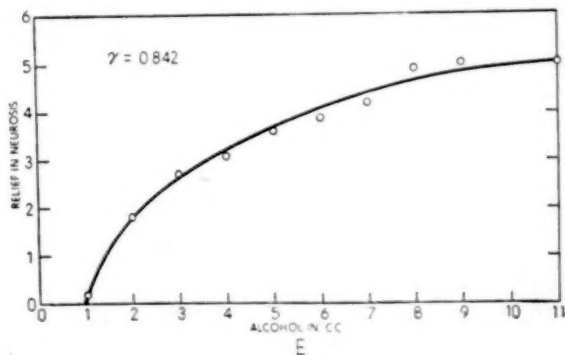
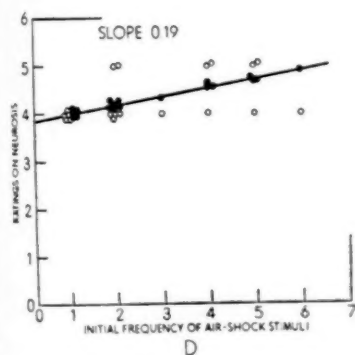
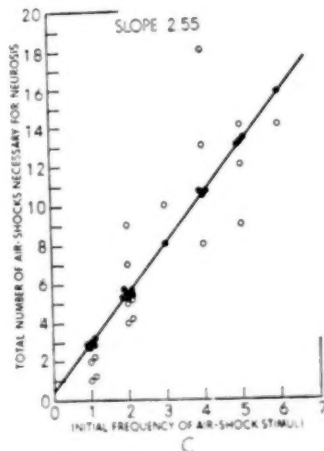
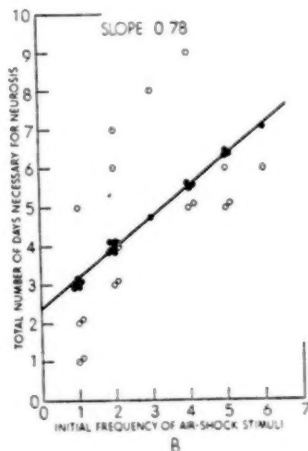
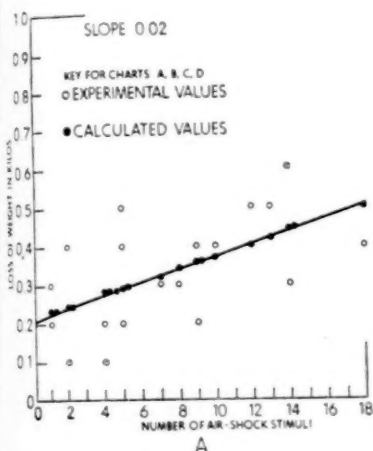


FIG. 2

Graph A: Regression line of loss of weight in kilograms in relation to number of air-shock disruptions of the feeding response. In this and subsequent graphs, circles represent experimental data and solid points indicate calculated values. The regression line is, of course, not accurate beyond about 15 A-S stimuli, since this number produces severe neuroses in almost all animals. On the other hand, even one such stimulus produces a mean loss of $0.2 \pm$ kilo.

Graph B: Regression line for the length of time in days necessary to establish a neurosis in relation to the number of air-shock stimuli required to abolish the feeding response on the first day of experimentally-induced conflict.

Graph C: Regression line for the number of air-shock stimuli the first day in relation to the total number required to induce a stable neurosis.

Graph D: Relationship of first-day traumata to eventual severity of the experimental neurosis.

Graph E: Curve of relief of neurotic symptoms (diminution in neurotic index on y — axis) in relation to dosage of alcohol in animal no. 5; no. of tests, 57; γ equals .842.

TABLE XII
CALCULATION OF THREE REGRESSION LINES ON THE BASIS OF THE INITIAL FREQUENCY OF AIR-SHOCK TRAUMATA

1 Animal No.	2 Total No. of days of AS		3 Total No. of times of AS		4 Degrees of neurosis		5 Initial frequency
	Calculated Y	Experimental y	Calculated Y	Experimental y	Calculated Y	Experimental y	x
1	3.96	7	5.52	9	4.17	5	2
2	6.30	5	13.15	12	4.73	5	5
3	4.74	8	8.06	10	4.36	4	3
4	7.08	6	15.70	14	4.92	4	6
5	5.52	5	10.61	13	4.55	5	4
7	5.52	5	10.61	8	4.55	4	4
8	3.18	5	2.97	5	3.98	4	1
9	3.96	4	5.52	5	4.17	4	2
10	3.96	4	5.52	5	4.17	4	2
11	6.30	5	13.15	9	4.73	4	5
12	3.96	3	5.52	4	4.17	4	2
13	3.96	6	5.52	7	4.17	5	2
14	5.52	9	10.61	18	4.55	5	4
15	3.96	3	5.52	4	4.17	4	2
17	3.18	2	2.97	2	3.98	4	1
18	3.18	2	2.97	2	3.98	4	1
19	6.30	6	13.15	14	4.73	5	5
20	3.18	1	2.97	1	3.98	4	1
21	3.18	1	2.97	1	3.98	4	1

distribution can be resolved into an equation for Y, the predicted value of y for each value of x, according to the regression formula:

$$Y = a + b(x - \bar{x})$$

in which b is the regression coefficient of x on y, and $a = \bar{y}$

$$b = \frac{(y - \bar{y})(x - \bar{x})}{(x - \bar{x})^2} = 0.015572$$

$$S^2 = \frac{1}{n-2} \sum (y - Y)^2$$

and the sampling variance of the statistic b is

$$\frac{S^2}{\sum (x - \bar{x})^2} = (0.005766)^2; t \text{ is therefore } 2.701.$$

With 17 d.f., P is between .01 and .02, indicating that the correlation is significant, although in this

case barely so. Similar analyses of the distributions of data in Tables XII and XIII and Graphs B, C and D show that the other correlations and regression relationships are even more stable from a statistical standpoint. In effect, then, the feeding inhibitions (weight loss) and other neurotogenic effects of various frequencies of conflict-engendering traumata can be predicted from our data with a relatively high degree of reliability.

Correlations of Neurotic Symptoms with Previous Behavioral Characteristics: Since an experimental neurosis constitutes, in effect, the disruption of "normal" adaptive behavior by an insoluble motivational conflict, it seemed of interest to compare the pre-neurotic characteristics of each animal (cf. Table II) with the number and intensity of neurotogenic traumata required to abolish its learned feeding responses. The data for the entire group and their statistical analysis are entered in

TABLE XIII
THE INITIAL FREQUENCY OF AIR-SHOCK TRAUMATA AS A BASIS FOR PREDICTION OF EXPERIMENTAL NEUROSIS

1 Independent variate	2 Dependent variates		
Initial frequency of AS	Total No. of days of AS	Total No. of times of AS	Degree of neurosis
Value of b.....	0.7798	2.5454	0.1889
Value for variance of statistic b.....	(0.2651) ²	(0.3887) ²	(0.06805) ²
Value of t with 17 degrees of freedom.....	2.942	6.548	2.776
Significance of b.....	Significant	Highly significant	Barely significant

Table XIV, from which the following inferences may be derived:

11. There are no significant correlations between the sex, weight, dominance position of the animal, or its speed of learning the feeding response on the one hand, with the number of air-shock traumata required to abolish the switch-manipulation,

significantly more aberrant than that of control animals if such traumata were repeated to point of neurotic disorganization.

Analysis of the Changes in Behavior Produced in Experimental Neuroses: The observations relevant to this aspect of our study are entered in Table XV, in which the numbers represent the

TABLE XIV

ANALYSIS OF DATA ON INITIAL FREQUENCY OF AIR-SHOCK AND CASE HISTORIES OF THE ANIMALS

A. SEX DIFFERENCE IN TERMS OF INITIAL FREQUENCY OF AS

Animal No.	Male	Animal No.	Female
1	2	3	3
2	5	4	6
5	4	7	4
9	2	8	1
10	2	11	5
13	2	12	2
14	4	17	1
15	2	20	1
18	1	21	1
19	5		

$$n_1 + 1 = 10$$

$$\bar{x}^1 = 2.9$$

$$t = 0.299$$

$$n_2 + 1 = 9$$

$$\bar{x}^1 = 1.883$$

$$d.f. = 17$$

The value of P is between .7 and .8

B. DOMINANCE-PASSIVITY RELATIONSHIPS IN TERMS OF INITIAL FREQUENCY

Animal No.	Dominance	Animal No.	Passivity
1	2	2	5
3	3	4	6
5	4	8	1
7	4	10	2
9	2	12	2
11	5	14	4
13	2		

$$n_1 + 1 = 7$$

$$\bar{x}^1 = 3.143$$

$$t = 0.213$$

$$n_2 + 1 = 6$$

$$\bar{x}^1 = 3.333$$

$$d.f. = 11$$

The value of P is between .8 and .9

C. THE CORRELATION COEFFICIENT BETWEEN LEARNING ABILITY AND INITIAL FREQUENCY OF AS

Animal No.	Learning ability	Initial frequency
5	8	4
7	9	4
8	9	1
9	8	2
10	9	2
11	8	5
12	7	2
13	8	2
14	7	4
15	9	2
17	10	1
19	12	5

$$r = 0.107$$

$$d.f. = 10$$

D. THE CORRELATION COEFFICIENT BETWEEN RATINGS ON FIGHTING AND INITIAL FREQUENCY OF AS

Animal No.	Ratings on fighting	Initial frequency
1	5	2
2	4	5
3	2	3
4	5	6
5	3	4
7	3	4
8	1	1
9	2	2
10	3	2
11	4	5
12	1	2
13	2	2
14	5	6

$$r = 0.730$$

$$d.f. = 11$$

This coefficient must be judged highly significant

signal-reaction and food-seeking on the first day of the experimental neurosis.

12. However, high ratings on pre-neurotic combativeness correlate significantly with relative resistance to neurotogenic traumata; *i. e.*, $r=0.730$, and with 11 d. f., the value of a correlation coefficient for .01 level of significance is 0.684. In effect, physically active and aggressive cats were likely to withstand initial air-shock traumata comparatively well; however, their behavior tended to become

respective means of the rated increases in the various categories of neurotic behavior (cf. Table I, A-P) as compared with the control data in Table II, columns 7 to 11. For instance as may be seen in line 1 of Table I animal No. 1 during its normal training period was an active, somewhat aggressive cat which readily entered the apparatus, resisted removal, avidly opened the food box at the feeding signal, tried energetically to reach caged mice, and remained friendly to the experimenter

throughout the training. In its neurotic state, however, (compare line 1, Table XV, columns 1 to 6) it consistently resisted being placed in the apparatus, attempted to escape from any degree of confinement, showed extreme aversion to the food-box and moderate avoidance of the experimenter, and made only desultory attempts to capture mice. In addition, (columns 6 to 12 in Table XV referring to neurotic behavior patterns G through O in Table I) animal 1 reacted with phobic hypersensitivities and startle reactions to stimuli previously associated with the feeding situa-

"neurotic" aberrations less directly associated with the central conflict.

14. The neurotogenic effects of the traumatic conflicts appeared in all 19 animals, though the intensity of the specific behavioral expressions of the neurosis varied from animal to animal. For the group, the order of decreasing intensity of the neurotic deviations was: 1) direct aversion to food; 2) escape behind barriers; 3) loss of interest in capturing mice; 4) phobic reactions to the feeding-signals; 5) escape from the apparatus; 6) motor disturbances; 7) reluctance to enter the experimental

TABLE XV
MEAN DAILY BEHAVIOR RATINGS OF NEUROTIC ANIMALS¹
A-D: DETERIORATION OF NORMAL BEHAVIOR; E-O: NEUROTIC SYMPTOMS¹

1 Animal No.	2 A ² Apparatus	3 B Escape	4 C Food box	5 D Mice	6 E Experimenter	7 G-I-J Phobias	8 H Switch avoidance	9 K Retreat	10 L Fear of constriction	11 M Motor disturbance	12 O Substitutive behavior
1	2	3	5	4	1	5	3	4	5	5	5
2	4	5	4	4	1	5	4	5	5	5	5
3	4	4	5	5	1	4	3	4	4	4	4
4	5	5	5	4	2	3	3	4	4	4	4
5	3	3	4	4	2	4	3	5	4	5	5
7	2	3	5	4	3	3	2	5	5	3	4
8	3	3	4	2	2	3	2	5	3	4	3
9	4	4	3	4	2	4	3	3	3	4	3
10	4	4	2	4	1	4	3	3	3	3	2
11	4	4	3	4	1	4	3	4	4	3	4
12	5	5	5	2	2	4	2	4	3	4	3
13	5	5	5	4	1	5	3	5	3	5	4
14	4	5	5	5	2	5	4	5	3	4	4
15	4	3	4	3	1	4	2	4	3	3	3
17	3	4	3	4	1	3	3	4	2	3	3
18	4	4	4	5	0	4	NT ³	3	2	3	3
19	4	4	5	4	2	3	4	4	3	4	4
20	2	3	4	4	1	4	NT	3	3	3	2
21	2	2	3	4	1	3	NT	3	2	2	2
Mean	4-	4-	4+	4-	1+	4-	3-	4+	3+	4-	4-

¹ Columns A-D represent the mean degree of deterioration of previously normal behavior ratings after the induction of neurosis; columns E-O list the mean daily gradings of the various neurotic aberrations induced.

² Letters on this line refer to the corresponding categories in Table I.

³ Not tested.

tion (signals, exposure of food, etc.), actively avoided the signal switch, retreated behind barriers away from the foodbox whenever possible, showed marked evidences of anxiety when forced into constricted spaces, and under increased experimental stress showed an accentuation of substitutive behavior and motor excitement sometimes ending in cataleptic rigidity (cf. fig. 1, A). A similar survey of the data for all 21 animals leads to the following conclusions:

13. The method of inducing a motivationally conflictful disruption of the feeding-response employed in our experiments led not only to specific inhibitions of learned ("conditioned") food-seeking behavior but also to a wide variety of pervasive

cage; 8) substitutive or compulsive behavior; 9) fear of constriction; 10) avoidance of the feeding-switch, and 11) diminution of friendliness with, or, conversely, a clinging dependence upon, the experimenter. Again, it may be seen that this list follows roughly the progressive remoteness of each behavior pattern from the original source of the neurotogenic trauma.

Effects of Alcohol on Neurotic Animals: As noted previously, alcohol in small doses disorganized the intricate adaptive patterns of normal animals while leaving the simpler, more deeply ingrained reactions comparatively, though never completely, intact. It seemed reasonable to postulate, therefore, that alcohol might also disorganize

the complexly aberrant patterns of recently-induced experimental neuroses and permit a reversion to the simple, more directly goal-oriented responses of more relatively "normal" behavior. To investigate this possibility, alcohol was administered

analyzed in Tables XVI and XVII, from which the following inferences may be drawn:

15. Within a moderate range of dosage, the amount of alcohol administered is positively correlated with the relief of neurotic symptoms, as

TABLE XVI
EFFECTS OF 10% ALCOHOL ADMINISTERED TO NEUROTIC ANIMALS BY INTRAPERITONEAL INJECTION

1	2	3	4	5	6 Restoration of response to:					7	8	9
Animal No.	Weight in kilos	Sex	Degree of neurosis	cc of 95% alcohol per kilo	Difficult switch problem	Switch behind barrier	Switch	Food signals	Opening food box	Caged mice	Mean relief of neurosis (Table I, G to O)	
1	1.4	M	5	1.0	NT	—	—	+	3	1	2	
				1.5	NT	—	—	+	3	2	3	
				1.25	NT	—	+	+	5	3	3	
2	1.7	M	5	1.0	NT	+	+	+	5	2	4	
3	1.9	F	4	1.0	NT	—	+	+	3	1	3	
				1.25	NT	—	+	+	3	0	3	
4	1.8	F	4	1.0	NT	+	—	+	4	3	2	
				1.25	NT	—	+	+	4	3	3	
				1.5	NT	—	NT	+	4	NT	3	
5	1.7	M	5	1.0	—	—	—	+	3	2	2	
				1.25	+	+	+	+	5	2	3	
				1.5	+	+	+	+	5	NT	4	

TABLE XVII
EFFECTS OF ENTERAL ALCOHOL ON NEUROSIS

1	2	3	4	5	6	7	8
Animal No.	Weight in kilos	Sex	Degree of neurosis	No. of trials	Range of alcohol intake in cc.	Range of relief of neurosis (0-5)	Pearsonian r between 6 and 7
A. BY ORAL INTAKE							
5	1.7	M	5	57	1-11	0.2-5.0	0.842
9	1.9	M	4	32	1-5	0.5-4.5	0.726
13	1.9	M	5	13	1-5	0-3.0	0.753
14	1.9	M	5	19	0.8-5	0-3.0	0.887
15	1.9	M	4	13	1-6	0.5-3.0	0.739
18	1.5	M	4	9	1-5	0-2.0	0.705
B. BY TUBE-FEEDING							
2	1.7	M	5	48	1-6	1.1-4.7	0.767
3	1.9	F	4	36	1-6	1.8-4.0	0.696
7 ¹	1.6	F	4	57	2-6	1.3-4.0	0.622
8	1.6	F	4	17	2-6	0.5-4.0	0.762
10	1.6	M	4	21	1-6	0.3-2.7	0.668
11	1.5	F	4	44	1-5	2.7-4.5	0.480
12	1.5	F	4	16	1-6	0.3-2.5	0.770
17	2.3	F	4	4	3-7	2.0-3.0	.....
19	2.2	M	5	16	1-7	0-3.7	0.888
20	1.5	F	4	19	1-4.5	0-3.0	0.770
21	1.7	F	4	20	1-6	0-4.0	0.872

¹Animal No. 7 had to have supplementary tube-feeding because of insufficient oral intake.

daily in various doses and by various routes to our neurotic animals, and its effects on their behavior in and out of the experimental apparatus were again rated objectively according to the criteria in Table I. The relevant data on the group of 19 animals over from 9 to 57 days of observation are

indicated by the restoration of the simpler switch and signal responses, the seeking of food, the pursuit of mice, and the mitigation of phobias, motor disturbances and other neurotic patterns as listed under criteria G to O in Table I. The curves of the extent of relief from neurotic behavior with

various dosages of alcohol tend to be sigmoid in form (*e.g.*, figure 1, graph E), but the Pearsonian coefficients are significantly high in all cases.

16. As indicated previously, the intraperitoneal injections of alcohol produced the most rapid effects (maximum in an average of about 15 minutes) whereas the time required for the action of alcohol taken by mouth or tube was longer (average of maximum action in about 40 minutes).

17. In conformity with the control observations, it was again noted that alcohol was not selective in its disorganization of neurotic patterns, but also

position-choice or chance incidence. The data are summarized in Table XVIII, and their analyses for the first three weeks of neurosis in Table XIX. From these tables the following further inferences may be drawn:

18. In the first week of the free-choice situation, 11 animals which had experienced relief from neurotic symptoms during previous artificially induced intoxications showed a definite tendency to take alcohol-milk spontaneously. Although this preference was only at the limen of statistical reliability, its significance was enhanced by the probability that the few "alcohol choices" during the animal's

TABLE XVIII
AVERAGE DAILY PREFERENCE FOR ALCOHOL OF THE NEUROTIC ANIMALS¹

1 Animal No.	2 First week	3 Second week	4 Third week	5 Fourth week	6 Fifth week	7 Sixth week	8 Ended by	9 Total No. of tests
1	0.83	1.33	0.67	0.17	....	....	C ²	66
2	1.17	0.80	0.17	....	....	....	C	48
3	0.40	0.20	....	....	....	....	RP ³	30
5	1.00	1.67	1.33	1.33	0.83	0.17	C	105
7	1.00	1.50	1.83	1.67	1.00	0.50	C	99
8	0.83	0.67	0.20	....	....	....	C	51
9	0.50	1.00	0.33	....	....	....	C	54
10	0.33	0.50	....	....	....	....	RP	33
11	1.17	1.83	0.67	0.17	....	....	C	63
12	0.83	1.17	0.67	....	....	....	C	54
13	1.85	1.50	0.80	....	....	....	C	54
14	1.50	1.00	....	....	....	....	C	30
15	0.67	0.33	....	....	....	....	C	36
17	0.80	....	....	....	....	....	RP	15
18	1.17	1.33	0.80	....	....	....	C	54
20	0.67	1.50	1.00	0.33	....	....	C	66
21	1.33	0.67	....	....	....	....	RP	33
No.	17	16	11	5	2	2	....	..
Sum	16.05	17.00	8.47	3.67	....	....	....	..
Av.	0.944	1.063	0.770	....	....	....	....	..

¹ The actual number of preferences for alcohol per week is divided by the number of experimental days. Since each animal makes three preferences per day, the maximum possible average is 3.

² C means that the animal consistently takes milk on three successive days, or in nine successive tests.

³ RP means that the animal frequently refuses to take the preference test.

disrupted—although in lesser degree—the timing, spatial orientation, sequence, and efficiency of "normal" goal-oriented responses.

The Development of a Preference for Alcohol by Neurotic Animals: Since, as has been demonstrated in our observations thus far, alcohol produced a demonstrable mitigation of neurotic behavior, there seemed to be a further possibility that animals which had experienced this relief might develop a preference or even an avidity for the drug. Accordingly, such animals were again given three series of choices per day between plain milk and 5% alcohol in milk, and their selections checked against factors of hunger, duration and degree of previous neurosis, extent of previous experience with alcohol, and the possibilities of

period of normality, though duly entered as such in the control figures, had actually been of an exploratory or food-seeking character, and thereafter abandoned until the onset of the induction of an experimental neurosis.

19. Similarly, while the nature of the data makes specific conclusions in the following regards not mathematically demonstrable, there were definite indications that those animals which had experienced the most marked relief of neurotic symptoms from the oral administration of alcohol (*e.g.*, animals 2, 11, 13 and 18) were most prone to begin ingesting the drug spontaneously (fig. 1, d). On the other hand, animals which had been rendered rapidly comatose by large doses of alcohol (*e.g.*, animal 10), or had suffered side-effects of nausea

COMMENT

Since the literature on experimental neuroses and the biodynamics of alcoholism has been extensively reviewed in many publications,⁸ another such survey may be omitted here. Similarly, the author has elsewhere attempted to demonstrate the heuristic significance of animal experimental studies in relation to the much more highly complex problems of clinical neuroses and alcoholic addiction,⁹ so that a recapitulation of such comments is also unnecessary. The present report, then, is concerned more specifically with an objective examination and analysis of the experimental data with a view to deriving statistically valid

TABLE XIX
ANALYSIS OF ALCOHOL-PREFERENCE OF NEUROTIC ANIMALS (CF. TABLE XVIII)

t - value		Weeks of neurosis		
		First	Second	Third
Number of animals with normal preference control		17	16	11
Significant difference between the alcohol preferences of animals in normal and neurotic states		t = 2.745 (barely significant; p lies between .05 and .02)	t = 2.914 (significant; p lies between .02 and .01)	t = 1.562 (not significant; p lies between 0.2 and 0.1)
Significant differences in alcohol choices of neurotic animals week to week	Difference between first week and second and third	n = 11 t = 0.916 (not significant; mean diff. = 0.110 with 0.120 standard error)	n = 10 t = 1.347 (not significant; mean diff. = 0.233 with 0.173 standard error)	
	Differences between second and third weeks		n = 7 t = 4.967 (clearly significant; mean diff. = 0.530 with 0.107 standard error)	

ished in all animals. As already noted, this phenomenon seemed closely correlated with many experimental observations to the effect that neurotic animals, while mildly intoxicated, became sufficiently disinhibited to re-explore the problem situation, try to work the switch, answer signals and seek food, and thus dissipate their neurotic phobias, aversions and aberrations. As relatively "normal" behavior became re-established, the animals' biodynamic need for alcohol diminished correspondingly, so that "normal" choices of non-alcoholic foods again supervened. In effect, it appeared that the temporary "alcoholic addiction" of severely neurotic animals did not spring from the development of an essential "physiologic" craving, but was itself a learned adaptation contingent upon intercurrent neurotic stresses and reversible when these stresses were resolved.

conclusions. These have been stated in the numbered paragraphs throughout the text and may now be generally summarized as follows:

SUMMARY

Control Observations: Twenty-one cats were taught first to obtain food by opening a box, then to respond to various conditional signals and finally to solve difficult problems involving the passage of barriers and the manipulation of switches to secure their reward. Alcoholic intoxication disintegrated their adaptative patterns to a varying degree, particularly affecting those that were most complex and recently learned. Normal animals, however,

⁸ For reviews by the author and his associates see references 4, 8, 10 and 14.

⁹ See Masserman (6), Chapters IX, XII and XIV.

showed complete restitution of function on recovery from intoxication, little habituation to alcohol, and no consistent signs of developing a preference for the drug.

Neuroses and Alcohol: The animals were subjected to special experimental procedures that induced and reinforced motivational conflicts between hunger and fear. Under such circumstances, they developed "experimental neuroses," characterized by pervasive inhibitions of normal goal-responses, hypersensitivities and aversions to stimuli associated with the conflictful field, loss of group dominance, and marked and persistent aberrations of somatic and motor function. The administration of small doses of alcohol again disintegrated these relatively complex "neurotic" patterns and permitted relatively simple goal-oriented responses to supervene. A significant number of animals who repeatedly experienced such relief from neurotic tensions developed a definite preference for alcoholic drinks; *i.e.*, showed evidences of addiction to alcohol. However, as their re-exploratory behavior while mildly intoxicated partially resolved conflicts, this addiction diminished until nearly normal food-choices were restored.

These general conclusions are substantiated by a presentation of objective experimental data and its analysis under statistical control.

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REVIEWS, ABSTRACTS, NOTES, AND CORRESPONDENCE

BRONCHIAL ASTHMA AND AFFECTIVE PSYCHOSES

REPORT OF TWO CASES TREATED WITH ELECTRIC SHOCK

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The occurrence of bronchial asthma in individuals of cyclothymic personality and in patients known to have attacks of manic-depressive psychosis has been discussed by a number of writers. Dunbar (2) and Vaughan (10) have reviewed most of the pertinent literature on this relationship.

Reichmann (8) pointed out that manic-depressive swings are of special frequency in asthmatics. She considered bronchial asthma a neurosis of the respiratory tract, a part manifestation of a general psychopathic constitution.

Hansen (4) observed that not infrequently certain asthmatic individuals show to a more or less marked degree symptoms of manic-depressive disease, and that asthmatic attacks predominate in attacks of depression.

Fenichel (3), by psychoanalytic method, showed that there is a definite inner relationship between manic-depressive disease and asthma on the one hand, and a definite psychopathological development on the other.

St. Saxl (9) reported the case of a patient who acquired bronchial asthma during the involutional period. Some years later he developed a manic-depressive disease picture in the course of which five exacerbations had been observed. Each time, the asthma subsided before the acute exacerbation of the psychosis, only to return suddenly with its subsidence.

Oberndorf (7) described a patient in whom the asthmatic attacks "were replaced by periods of mental unrest, closely resembling manic excitement which lasted about a month."

MacInnes (6) reported on five cases of asthma in a survey of more than 7000 patients in two mental hospitals. Three of the five cases gave no history of attacks during the mental illness, but upon a return to mental balance showed definite manifestations of asthma.

Leavitt (5), in a survey of over 11,000 patients with functional psychoses, found 10 cases of asthma, the highest incidence occurring in the manic-depressive states. He pointed out that in those cases where

bronchial asthma and schizophrenia co-existed, the patients did not show marked disorganization and were "easily contacted."

Brown and Goitein (1) studied the personality variables in asthma and concluded that the asthmatic subject is of a cyclothymic disposition associated with paranoid features, repressed hostility and self-punishment motives.

The purpose of this report is to describe the case histories of two patients suffering from affective psychoses in both of whom asthmatic attacks had occurred for years preceding the psychotic manifestations. These attacks had responded symptomatically to inhalation of epinephrine. All asthmatic symptoms had disappeared during the course of the acute depression they both underwent. Both men entered the hospital following suicidal attempts. Electric shock treatment produced a rapid remission of the depressive state in both and it was observed that, occurring simultaneously with this improvement, the asthma returned. No change in environment or any alteration of exposure to allergens could be held accountable for the return of the asthmatic symptoms.

Case 1. W. F., age 45, separated white male, Catholic, admitted to this hospital on December 12, 1942 following attempted suicide by drinking a mixture containing carbolic acid, mercuric chloride and turpentine. Diagnosis: Schizo-affective disorder.

There was no indication of any mental or allergic disease in the family history. It is interesting to note that one of the neighbors, whom the patient knew from the time he was 3 years old, until she died, when he was 18, had "exactly the same kind of asthma" that he had. She was always a real "aunt" to him, and he was very close to her. Her son also had a severe asthmatic condition; he was a friend of the patient.

About 1932, the patient had a series of severe colds within a few months. Some were so severe that he was put to bed for several weeks. It was at this time that he had his first asthmatic attack. He experienced subsequent attacks of asthma con-

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tinuously from then on. The attacks were worse at night. The patient observed no relationship between the frequency of attacks and various foods that he ate. Although he suffered from asthma throughout the year, his attacks were more acute between the months of May and September. With regard to environment, the patient experienced relief at the home of an aunt living twenty miles from his own home. He went there often as he was particularly fond of this aunt, and liked to be in her home. The patient admitted that, in general, his asthmatic attacks were worse during the course of emotionally upsetting experiences. He obtained relief from his attacks by inhalation of epinephrine solution.

The patient's first episode of depression began in December 1940, when he tried to commit suicide by firing a gun into his brain. The gun did not go off, so he took the shell out of the revolver and put it in the kitchen stove where it exploded. He was very depressed at that time and was seen at the clinic of the Mental Hygiene Society of Maryland. There, he attributed his suicidal attempt to nervousness and imagination. He appeared anxious, somewhat depressed, expressed paranoid delusions and was hallucinated in the auditory field. The psychiatrist's impression was that the patient was a paranoid schizophrenic and that commitment would probably be necessary. It was decided, however, to see him regularly at the clinic, his brother being told to watch him closely and report if he seemed worse or very depressed. He was seen at the clinic from January 21, 1941 through October 13, 1941. Almost immediately he began to show some improvement which continued. There was no further evidence of hallucinatory experiences or paranoid trends. In interviews it was noted that his respiration became wheezy and asthmatic when speaking of his mother, wife or children. Even his asthma improved under psychotherapy. He returned to the same clinic on November 20, 1942 because someone had suggested to him that he should have a check-up. At this time it was observed that his asthma had improved and that he showed no signs of hallucinations. He complained, however, of his "mind wandering." He was rather manneristic but in general he seemed in fairly good condition. On December 11, 1942 the clinic was notified that he had attempted suicide on the preceding day by swallowing a mixture of carbolic acid, corrosive sublimate and turpentine. For a month prior to his suicidal effort the patient had been growing worse, could not keep a job, had been hearing voices, had paranoid ideas, and so

forth. Seen again at the clinic he brought out many paranoid ideas and sex ideation. It was at this time that he was committed to the Springfield State Hospital.

On admission, the patient was quiet and fully cooperative. He admitted freely hearing voices, stating the content as being concerned mostly with sex. He complained of pressure in his head and the feeling that his mind was a blank. Shortly after admission, the patient began to show increasing evidence of confusion and agitation. He kept repeating "My God." He complained of giddiness and nervousness, that his brain felt numb and that he felt pressure on his head. He admitted hallucinations such as seeing the Lord, Heaven and the angels. He also stated that he heard the voice of God and other voices of a terrifying nature. He did not want to describe these hallucinations in any detail.

Physical examination on admission showed blanched areas of the lips due to the effect of phenol. Other findings were essentially within normal limits. There was no evidence of asthma other than for the observation that, in deep breathing, the auxiliary muscles of respiration were used to a greater extent than one usually sees. No râles were heard and respiration was not difficult. The laboratory findings were not remarkable. The leucocyte count was 11,500 and there were 2 per cent eosinophiles in the differential count. Fluoroscopic examination of the chest showed both apices to be hazy; heart and aorta were normal. Electrocardiogram showed a normal mechanism.

During the month that followed his admission to the hospital, the patient grew increasingly worse. He refused to eat and it was necessary to feed him by tube. He was intensely agitated and was constantly attempting to take his life. He thought that members of his family were on the adjacent ward and kept asking to be allowed to see them.

Electric shock treatment was started on January 25, 1943. Between that date and February 15, 1943 the patient experienced six convulsive reactions. He improved considerably, his agitation diminishing and the delusions disappearing. No further hallucinatory experiences occurred for a time. He would repeatedly request to go home, even though told that it could not be granted. He was cooperative to ward routine, did his work well and ate without persuasion. It was observed that as soon as mental improvement began, the asthma returned. There was a relapse in the early part of March and further electric shock was given. From March 11, 1943 through April 12, 1943, the patient experi-

enced thirteen more convulsive seizures. At the end of this course of treatment it was felt that he showed moderate improvement; that he was somewhat tense and still expressed ideas about his family being in the hospital on some other ward, but the extreme agitation and suicidal attempts had gone. The asthma was present and necessitated the use of epinephrine inhalations from time to time. On April 16, 1943 he was transferred from the Admission Building to the Men's Group. He objected to this transfer and became resentful, passively resistive and unable to sleep. Within a few weeks he became adjusted to his new situation and seemed less tense and anxious. An interview on May 8, 1943 revealed that the patient had considerable amnesia for his psychotic experiences. He denied hallucinations. It was also observed by the physician in charge of the ward to which he had been transferred that the patient was not asthmatic when mentally disturbed and that as soon as mental improvement occurred the asthma became more severe. This pattern, as already mentioned, has occurred during the course of electric shock treatment.

While plans were being made for the patient's parole from the hospital, he decided to take matters into his own hands, and, on June 21, 1943 he escaped from the hospital. His status was subsequently changed to "on parole" and he was followed in our city clinic where he was seen five times during the year that followed his escape. He made a satisfactory adjustment on the outside and was working at the time of this report. On June 21, 1944 he was discharged from parole.

Interviewed on June 22, 1944, the patient stated that his asthma continued but that, since leaving the hospital, there were no severe attacks. He expressed the opinion that the electric shock therapy not only helped his mental condition but also relieved the intensity of the asthmatic attacks. He obtained relief from those attacks he did experience through the inhalation of epinephrine.

Case 2. H. H., age 39, married white male, Catholic, admitted to this hospital on January 25, 1944 following a suicidal attempt by slashing his wrist and arm with a razor blade. Diagnosis: Manic-depressive Psychosis—Depressed Phase.

There was no family history of mental or allergic disease.

It was stated that the patient could never refuse an offer of a drink. Being a waiter, access to beer and whiskey was easy, and someone was always treating him. The first serious repercussions of his drinking were felt two years before his admission.

At that time there was an episode of delirium tremens. Since then, it was further stated, he drank no whiskey but did consume a considerable amount of beer.

Asthmatic symptoms first appeared in 1929, about one year after the patient came to this country from Germany. The patient had had only two severe attacks since then. The first one, occurring at the onset of his asthmatic illness, necessitated his staying away from work for three or four weeks. In 1936 he had the other severe attack but this lasted only two days. Less serious episodes of asthma occurred frequently and responded to inhalation of epinephrine.

The asthmatic condition became more acute, in the patient's opinion, when he ate lobster, shrimp or crab meat. Moreover, his mouth became "full of blisters" when he ate shrimp or lobster, and his face "swelled up noticeably" when he ate crab meat. He could not eat food cooked in grease because these also caused his asthma to become much worse. Different seasons seemed to have no particular effect on his condition. However, he believed that rainy and damp weather during any season made his condition worse. Environment did not seem an important factor in precipitating attacks. The patient felt that his asthma became worse when he got excited, tired or over-heated.

About the middle of December 1943, the patient began to experience auditory and visual hallucinations. According to the wife, this appears to have been similar to the previous attack of delirium tremens. About two weeks before admission, the patient began to sleep very badly, was exceedingly nervous and perspired continuously. He also lost his appetite. Later, he came home from work, very upset because he had seen two men in the street engaging in homosexual activities. He talked about this to his wife. He also expressed the belief to his wife that those same men made advances toward him and he had to fight them off. He went straight to the bathroom after telling her of this matter and cut his arm in two places with a razor. He was rushed to a general hospital where he was found to have lacerated wounds at the left wrist and at the antecubital fossa, a severance of the flexor tendons at the wrist and injury to the median nerve, radial and ulnar arteries. The lacerations were sutured and the patient kept at the general hospital for eleven days. While there, he was restless, got up during the night at different times, trying to escape. He was excited and experienced auditory and visual hallucinations. He was trans-

ferred to the Springfield State Hospital on January 25, 1944.

On admission, the patient was somewhat tense but quiet and in good contact. He was well oriented and stated that his trouble was due to drinking. Mental examination, done shortly thereafter, showed him to be depressed and apprehensive. He was self-accusatory, worried about having disgraced his family and wished that he were dead. He told of a homosexual affair he had had with a man in a saloon. This took place the week before Christmas, 1943. He assured the examiner that it was his first and only experience of that kind. Later he felt that people in the saloon, where he and the other man were regular customers, began to make remarks about him. He felt that the other man had told them what had happened. He thought that he had brought disgrace to his family and the only way out for him would be his death. He admitted having seen reindeer in miniature on the ceiling and heard voices calling him names, cursing and threatening him. These hallucinatory experiences were no longer present when he was interviewed, and he recognized them as imaginations.

Physical examination, other than for evidence of his recent injury, hypertension of 160/95 and tachycardia, rate 130, was within normal limits. No evidence of asthma was present in the course of the initial physical examination or at any time during the period of depression that continued. Fluoroscopic examination of the chest showed heart and aorta within normal limits and the lungs were clear. Electrocardiographic study showed left axis deviation. Laboratory studies revealed a moderate degree of anemia (hemoglobin 11.5 grams; R. B. C. 3,800,000), leucocyte count was normal; there were 2 per cent of eosinophiles in the differential count.

The patient continued to be depressed and rather preoccupied on the ward, indulging in little or no activity. He continued to express feelings of guilt about sexual perversions. He spoke slowly and in a low voice and usually tried to avoid facing the physicians directly. He entertained hopeless ideas about his outlook for the future. He remained in this depressed state until electric shock treatment was started on March 11, 1944. Shocks were given three times a week. The patient experienced seven convulsions. This therapy effected a prompt recovery from his depressive symptoms. However, he became rather euphoric and appeared as if he were going to swing over to a state of manic excitement, so his treatment was stopped. He showed

moderate confusion and memory defect toward the end of the series of convulsive reactions, had no insight, and kept insisting strongly upon his immediate release from the hospital. Within the next two weeks the patient again became moderately depressed and then showed further improvement. By the middle of April, his mood was considered normal by the members of the medical staff, by his wife, and by other relatives who visited him. No expression of psychotic ideation could be elicited and the patient appeared to be in good contact, showing real appreciation of the nature of his illness and demonstrating a pleasing sense of humor. When this improvement started, it was observed that the patient began to use a nebulizer of epinephrine that his wife had brought him. Mild asthmatic attacks, completely absent during his depressed condition, had returned. The patient was paroled to his wife on May 7, 1944.

The cases presented here conform in a number of respects to others previously reported. Both patients suffered from affective psychoses, although schizophrenic symptoms were present in one of them. The paranoid features and self-punishment motives described by Brown and Goitein (1) were apparent. There is a close similarity between the course of these two patients and those described by other authors with regard to the apparent inability for asthma and manic-depressive attacks to co-exist. The difference between the cases described in this paper and the others may be found in the fact that these two men recovered through the agency of electric shock therapy, at a time imposed upon them by the physician, rather than spontaneously in the natural course of the illness.

One naturally seeks an explanation for the phenomenon here described. St. Saxl (9) explained this "striking antagonistic relationship between asthma and manic-depressive attacks" by assuming that "the psychosis through a change in the ion concentration of the blood produced a change in the vegetative milieu which made impossible the persistence of asthma. With the subsidence of the psychosis and the re-establishment of the previous ion concentration in the blood it became possible for the asthma to reappear." Commenting on this, Dunbar (2) pointed out that St. Saxl did not discuss the psychological aspect, that is, the possibility (well established in other instances by psychoanalysis) that both phenomena, manic-depressive attack and asthma, are different expressions—one more psychic, the other more somatic—of the same underlying psychic constellation. Whether the biological or psychological interpreta-

tion is correct is a controversial matter into which the writer has no desire to enter. It is probable that both are operative in the apparent antagonism of the affective and allergic disorders.

SUMMARY

Two cases have been described in which the patients had suffered for years from bronchial asthma. Both later experienced symptoms of affective psychoses. During the depressive period, all signs of asthma disappeared. Electric shock treatment caused improvement of the mental illness and, coincident with it, the asthmatic symptoms returned. Certain personality characteristics elsewhere described, such as mood swings, paranoid features and self-punishment drives, were found to exist in these two patients.

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NOTICES

ANNUAL MEETING

May 11th and 12th, 1946
Hotel Pennsylvania
New York

May 11th
A.M.

Contributions of Military Medicine to Psychosomatic Medicine
P.M.

Psychosomatic Aspects of Orthopedic Practise

ANNUAL DINNER

"New Advances in Psychosomatic Investigative Techniques"
(An Illustrated Parody)

BERTRAM D. LEWIN, M.D.

May 12th

Submitted Papers

Persons wishing to present papers on May 12th will please send four copies of the title and abstract to the Program Committee, 714 Madison Ave., New York 21, before March 1st.

ROY G. HOSKINS, *Chairman*

CARL A. L. BINGER

MILTON J. E. SENN

EDWARD WEISS

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Dr. Gerald H. J. Pearson, Associate Professor of
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NOTICE FROM THE COMMITTEE ON PUBLIC EDUCATION, THE
AMERICAN PSYCHIATRIC ASSOCIATION

The American Psychiatric Association and the National Committee for Mental Hygiene jointly announce the appointment of Captain Forrest M. Harrison (MC), U. S. N., as Director of a newly established Psychiatric Personnel Placement Service. The service is designed especially to help physicians and psychiatrists make contacts with training opportunities such as residencies, post-graduate courses, and fellowships, and to aid institutions in locating suitable candidates for appointments. Physicians interested in psychiatry are invited to send in full biographical statements including personal data, education, training, experience, and special desires, in order that this service may be of the greatest possible assistance to them.

Deans of medical schools, superintendents of hospitals, and directors of industrial organizations, clinics, and others employing or participating in the training of psychiatric personnel, are invited to submit full information regarding available positions and courses, including financial details.

Foundations, universities, and other agencies are asked to report pertinent fellowships in psychiatry, psychosomatic medicine, and child guidance.

Inquiries should be addressed to:

Captain Forrest M. Harrison (MC), USN
National Committee for Mental Hygiene
1790 Broadway
New York City, 19

REPORT FROM THE JOSIAH MACY, JR., FOUNDATION

Dr. Willard C. Rappleye, President of the Foundation, has announced that more than 5,000,000 copies of over 400 leading medical and scientific articles have been published by the Foundation's War Reprint Service during the last three years, for medical officers in the armed forces of the United States, and in so far as possible for her allies. In addition, the Foundation published original monographs, medical literature reviews; and a News Letter for the Rheumatic Fever and Streptococcus Control Program of the Army Air Forces was published monthly. The Foundation expended over \$225,000 in financing the War Reprint Service. With the plans for demobilization of the armed forces, the Service will be discontinued by January 1st.

EDUCATIONAL FILMS

The New York University Film Library announces that the first three films in a series of studies on integrated development, "The Interaction between Child and Environment" by Dr. Margaret E. Fries of the New York Infirmary for Women and Children, are now available. The individual film titles are: 1. "Some Basic Differences in Newborn Infants during the Lying-In Period"; 2. "Psychological Implications of Behavior during the Clinic Visit"; 3. "Family Life of Navaho Indians." The films in this series have been made for professional groups—pediatricians, obstetricians, psychiatrists, psychologists, trained nurses, social workers, and teachers.

ANNOUNCEMENT FROM THE NATIONAL FOUNDATION FOR
INFANTILE PARALYSIS

Dr. Morton A. Seidenfeld has been added to the staff of the National Foundation for Infantile Paralysis as Director of Psychological Services. Dr. Seidenfeld has been Chief Psychologist of the Army and has been on active service since 1940.

NOTICE

Since the interest in psychosomatic medicine is expanding so rapidly, we are planning to review, during the year 1946, 100 American and foreign medical publications. Articles of special interest to our readers will be abstracted and those of a more general nature will be listed by title.

DOCTOR WALTER B. CANNON

Doctor Walter B. Cannon died in his 74th year on October 1st, 1945 at Franklin, New Hampshire. In a recent issue of the *Saturday Review of Literature*, Dr. Carl Binger, in reviewing Cannon's autobiographical volume, has stated with admirable clarity and effectiveness the meaning of Cannon's life and work:

"Doctor Cannon had won a unique place in medicine. He exerted a synthesis between the widely separated universes of body and mind. This resulted not only from the nature of the problems he investigated but also from the atmosphere of tolerance which always surrounded him. His laboratory was a businesslike place. Everyone had a job to do and did it, not from pressure or exhortation or even from the feeling of being just one big happy family, but because he wanted to do it. Doctor Cannon was hospitable to all kinds of men and all kinds of ideas—if they were honest ones.

"As one surveys his published researches one can appreciate the growth and fulfillment of his ideas. While still a young student he placed a live goose in a frame and passed the newly discovered Roentgen rays through its neck for the purpose of demonstrating the passage of a small metal ball through the goose's gullet. This led to his investigation of the movements of the stomach and intestines by the use of meals mixed with bismuth subnitrate—like the metal ball, a substance opaque to X-rays. Cannon noticed, on occasion, that the peristaltic movements did not occur in the usual orderly and rhythmic way. Apparently, the digestive process was stopped when the experimental animal was in a state of excitement. This simple observation opened up for him the whole field of bodily response to strong emotion, and from it followed naturally his studies on the emergency function of the adrenal glands. Thence, he turned to a consideration of the sympathetic nervous system and the behavior of the heart isolated from all nervous connections. Using this organ as a delicate indicator, he demonstrated the existence of chemical mediators. Each one of these problems was attacked with vigor, with strategy, and with an amazing manual skill, and often with the assistance of gifted co-workers whom he had trained. Dr. Cannon could have been a great surgeon or a wise and brilliant physician, but he stuck consistently to his own inner genius without regard to practical exigencies—except when his country was at war. His energies were then put at its service.

"He will be known as a pathfinder, a trail blazer like his progenitor, Jacques de Noyon, the voyageur. He was a mountaineer in physiology, and the new territory he discovered will keep surveyors busy for years to come.

"He was no closeted recluse. He was a liberal influence in medical education. He led the fight against those misguided, misinformed, cynical "humanitarians," the antivivisectionists. From the start, he espoused the cause of Republican Spain and recognized early what was at stake in its death struggle. He has befriended the Soviet scientists who love and honor him. He was one of our best ambassadors of good will. Walter B. Cannon has, in truth, been good to the world."

CARL BINGER

REVIEWS OF PERIODICAL LITERATURE

Roussy, G.: *Neuro-Endocrine Regulatory System and its Disturbances*. Schweiz. Med. Wchschr., 75:884, 1945.

Recent investigations have shown the important rôle of the midbrain in the regulatory mechanisms of hormonal and neuro-vegetative functions. This is even more evident as knowledge increases about the connection between midbrain and pituitary and pineal glands. Careful study of the gray substance at the base of the third ventricle of the tuberal region and of the hypothalamus led to the concept of a veritable neuro-glandular system, the "Hypothalamic-Pituitary Complex."

The findings can be summed up as follows:

I. Hypothalamus

Numerous nuclei (about 43) are found and they are the effectors of endocrine-exocrine vegetative functions, vegetative-motoric, trophic-motoric functions and also regulators of neuro-somatic functions. The nerve paths (efferent) from the hypothalamus lead to the bulbar centers (parasympathetic) and to the medullary centers (ortho- and parasympathetic). Thus the hypothalamus takes over the place the bulbar region had before in scientific concepts, that of an important superior vegetative center. Other fibers go towards the pituitary through the stalk and through the hypothalamic-hypophysary tract (Roussy-Mosingier). They are distributed in the different lobes of the pituitary. The importance of the hypothalamus may thus be explained in the growth and function of the sex organs by the intermediation of the pituitary. There are also fibers towards the retina, intermixing with the optic nerve (tangential-retinal fascicle). Others go to the extrapyramidal formations of the mid-brain and diencephalon. Some finally go towards the thalamus and cortex.

These fibers represent the anatomic substratum of the hypothalamic part, playing a rôle in affect, emotion and certain higher psychic functions.

The afferent fibers arrive from:

1. Sensorium. This explains the influence of the environment on the development.
2. Cortex. This explains how the psyche may intervene in organic functions.
3. Corpus Striatum, thalamus and cerebellum.

II. Pituitary

The adenohypophysis is derived from the digestive epithelium.

The neurohypophysis is of ectodermal origin and of glial structure.

The secretion of the adenohypophysis is called neurocrinic.

The secretion of the neurohypophysis is called neuricrinic.

The pituitary is compared to the adrenal gland, the adenohypophysis to the cortex and the neurohypophysis to the medulla. The innervation is from the superior cervical ganglia (sympathetic) and from the hypothalamic-pituitary fascicle (parasympathetic). Thus the hypothalamus steers the function of the pituitary, which in turn, by way of its hormones, regulates the function of all endocrines, and partly metabolism and tissue growth.

III. Diencephalon

This, besides the hypothalamus, has also vegetative functions, which are not yet completely understood.

1. Thalamus. This has associative functions and neuro-vegetative functions, which latter it exercises by way of direct thalamo-medullary and thalamo-hypothalamic fibers. This is demonstrable in the thalamic syndrome.

2. Epithalamus. (Commissura habenularum.) There are many fiber tracts to the gray periventricular substance of the thalamus and to the pineal gland.

IV. Endocrines

The endocrines of neuro-ectoblastic origin (neuricrines) attached to the diencephalon are derivatives of the ependyme. These comprise:

a. the organs that developed an endoventricular secretion during their phylo- and ontogenesis. They are the chorioid plexus and the paraventricular organ of the hypothalamus.

b. structures with essentially vascular secretion and with two types of cells. Those between ependyme and neuroglia are called: hypendymocytes. The others are of ependymal type.

c. Other cells have a double polarity: endoventricular and endonervous on the one hand and hemocrine secretion on the other. These form the hypo- and epiphysis. These structures have many neural connections with the diencephalon.

V. Conclusion

In conclusion it may be said that the diencephalon and the attached endocrines form the regulatory system for most vegetative body functions. This is the "Hypothalamo-Pituitary Complex."

The concept of another system superior to the hypothalamo-pituitary complex and influencing it has recently been formulated. It too consists of a gland and brain substance, the pineal and the epithalamus; the "Epithalamo-Pineal Complex." It acts through ependyme and third ventricle and represents thus a veritable endocrine glandular system of the brain; the "Neuricrine Glands of the Diencephalon."

All these glandular and nervous structures are connected with each other and with other regions of the

brain, cortex, rhombencephalon, bulbus, medulla, and peripheral sympathetic ganglia. Intimately connected with all the endocrines of the body, they form a neuroglandular regulatory system that dominates the metabolism. These structures therefore control all the metabolic and instinctual manifestations and, at the same time, together with the cortex, emotions, affect, and perhaps even the will.

The concept of strict separation of intellectual and vegetative functions has persisted for a long time. Anatomic and experimental studies, however, have shown that many paths lead from cortex to vegetative centers and vice versa. This of course favored the concept of intimate interaction. For example, lesions in the prefrontal cortex lead to disturbances in the realm of instinctual tendencies. Bailarger and Hughlings Jackson believe to have found here the beginning of an organic explanation for many mental disturbances.

The limits of physiology and psychology will have to be revised on the basis of these new concepts.

It is felt strongly that psyche and soma form an inseparable unit and that any disturbance in one sphere will inexorably have its effect on the other. (O. P.)

V. LUCADOU, W.: *Structure and Function of Adrenals; New Concepts*. Zschr. f. klin. Med., 143:444, 1944.

On the basis of careful histological studies the present concept of the adrenal gland is reevaluated. A continuity could be shown between the cell strands of the cortex and the marrow. The adrenal consists of units called epinephrons. Each unit can be divided, from periphery to center, into glomerular, fascicular and reticular zone, with the marrow tube as most central part.

Studies by several authors have shown that the adrenal is fully developed only after puberty. The development of the marrow is taking place post-embryonically and it can be seen as a distinct structure only after the second year of life.

In regard to secretion, the adrenal cortical region is thought of as a holocrine gland, in agreement with Kolmer, Askanazy, and others. It was frequently possible to observe lumina surrounded by cells in the glomerular zone.

The marrow is regarded as a merocrine gland with spaces parallel to the cells, ending in the central vein.

It will be necessary to revise the therapeutic approach to circulatory failure. In hypertonics and cardiac patients without hypertension, hypertrophy of the marrow was found and frequently a decrease of cortical substance. The fact that corticosterone does not show the effect in Addison's disease originally expected, and that adynia remained often after good compensation of heart failure, as well as other clinical observations, leads to the concept that cortical and medullary secretion act as a unit.

The conclusion to be drawn in many cases of heart failure is that it is not sufficient to drain the patient but attention must also be paid to his frequent adynia;

this will have to be brought about by using the new knowledge about the function and structure of the adrenal. (O. P.)

MOLLARD, H., AND MASCHAS, H.: *Interventions on the Neurovegetative System in Pulmonary Tuberculosis*. Paris Medical, 33:183, 1945.

Every year brings new proof of the influence of neuro-vegetative imbalance on the development and progress of pulmonary tuberculosis. This conforms with the increasing recognition of the important rôle of the vegetative nervous system in general pathology. Of course this is less appreciated by phthisiologists used to statistical study of disease than by those with a dynamic concept.

The oculo-cardiac reflex was used by Claize to evaluate the neuro-vegetative stability.

Hemoptysis is regarded as a pulmonary expression of a general vasomotor disturbance. Similar factors seem to play a part in all the unexplained accidents at pleural interventions or in pneumothorax therapy.

The main purpose of therapeutic efforts in pulmonary tuberculosis should be to reestablish the balance of the neuro-vegetative system, which in susceptible persons very easily is disturbed by factors such as changes in atmospheric electricity, endocrine disturbances, anaphylactic shock, trauma and emotions.

Phrenicotomy is believed to act more by its influence on the vegetative system than by its mechanical effect. The same factor is thought to be active in pneumothorax and thoracoplasty.

The author suggests direct intervention on the vegetative system either by neurotomy or by infiltration of the ganglia. Leriche did intravenous injection of novocaine in cases of grave dyspnoea in patients with emphysema, asthma or pulmonary tuberculosis. (O. P.)

MILLER, MICHAEL M.: *Low sodium chloride intake in the treatment of insomnia and tension states*. J. A. M. A., 129:262, 1945.

Twenty patients suffering from insomnia and tension states were treated by means of a salt-restricted diet.

Pronounced or moderate relief from tension and insomnia were observed in all but 3 of the cases.

Controls on 13 patients revealed that 10 patients suffered relapses following the addition of salt to the diet.

Improvement was noted generally in the duration and regularity of sleep, with a concurrent reduction in lability and intensity of emotional response on the lower salt intake.

No abnormal electroencephalographic alterations followed sodium chloride reduction, and better alpha indexes were observed in those patients exhibiting clinical improvement.

No untoward effects were observed in patients receiving moderately restricted salt diets.

Improved sleep and reduction in tension was usually accompanied by lowered blood pressure, lowered pulse rate, and additional evidence of reduced sympathetic tone.

The actual psychiatric condition of the patients was not materially altered, except as it might be benefited by reduction in tension and improved rest.

The application of low sodium chloride diets as described is suggested as an important adjunct to psychotherapeutic measures in the treatment of insomnia and tension states. (F. V. L.)

ABRAHAM, A.: *Chronic Fatigue*. Lancet, 249:421, 1945.

In most organic diseases, except for the most severe, fatigue is not an outstanding symptom. If it is fatigue that brings the patient to the doctor, no physical explanation for it can usually be found. This is especially disappointing to the physician who is not familiar with the psychosomatic point of view. There are many popular beliefs, in this connection, to which the physician occasionally bows, be it voluntarily, or by the patient's will.

Focal infection, auto-intoxication (especially from the intestinal tract), night starvation, and above all avitaminoses have been exploited as reasons for chronic fatigue, and an immense amount of medication, from vitamins to sedatives and tonics, is given to the patient. Considering the symptom psychosomatically one may link it up with the state of weakness and exhaustion in hypoglycemia. This in turn is connected with the endocrines: the influence of the psyche on this system and its consequence on fatigue could thus well be linked up. In short, the influence of irregular living is discussed. It is stated that intellectual work when enjoyed rarely causes fatigue.

"Complaint of overwork is an indication of mental ill health, not a cause. The doctor has to look into the personality to find out the part actually played by the physical and mental output in the production of chronic fatigue . . ." (O. P.)

MORRISON, LESTER M.: *Peptic ulcer disappearance after feedings of normal human gastric juice*. Am. J. Dig. Dis., 12:323, 1945.

Six normal volunteer male subjects were secured and large quantities of gastric juice obtained from them. These normal volunteer subjects ranged in age from 24 to 35, were free from any gastrointestinal symptoms, were either senior medical students or junior internes, and were normal to routine physical examination. Their gastric juice acidities all fell within normal limits following stimulation by histamine. All other features of their gastric analyses were normal.

Two stimulations with histamine, 1 mg. dosage were administered subcutaneously one hour apart to each subject. The gastric contents were collected over a three hour period of time at fifteen minute intervals. The first gastric juice extraction, however, was discarded to avoid its pepsin content and to insure only a relatively negligible amount of pepsin and mucin.

The gastric juice was then rendered neutral by sodium hydroxide, filtered, and further rendered bacteriologically sterile by 0.3% triresol as a preservative.

A series of 10 unselected, consecutive ambulatory patients with uncomplicated gastric and duodenal ulcers were studied. Each patient had an ulcer that was roentgenologically demonstrable as a niche, a crater or an ulcer defect, in addition to the associated roentgen findings of peptic ulcer, such as spasm, increased emptying time, local pain to palliation under fluoroscopic guidance, etc. These patients were placed on a normal, well-balanced diet with no restrictions other than the avoidance of alcoholic beverages. Smoking was permitted to those who were smokers.

One half ounce of normal gastric juice was fed to each patient every hour diluted with two ounces of tap water during waking hours. No other oral or parenteral medication was given of any description. Psychotherapy and suggestion were avoided as far as possible.

The patients ranged in age from 25 to 58 with an average of 40, 7 males, 3 females. Average duration of symptoms prior to this study: 9.3 years, ranging from one to 25 years.

Five duodenal ulcers, three pre-pyloric and two gastric ulcers were present in these 10 patients.

Eight of the 10 patients responded in from 24 to 48 hours to the feeding of normal gastric juice by becoming free of ulcer symptoms. No ulcer recurrences have occurred in these 8 patients during a 3-year follow-up period. (F. V. L.)

HYLAND, H. H.: *The Diagnosis of Ménière's Syndrome*. Bull. Acad. of Med., Toronto, 19:8, 1945.

Ménière's Syndrome is easily diagnosed if only a few points are kept in mind. The trias is vertigo, unilateral deafness and tinnitus. In addition there is frequently nausea and even vomiting. Deafness is the most reliable sign in establishing the laterality of the affection, only 10% of the cases being bilateral. Tinnitus appears in all grades of intensity and may even persist between the attacks. In differential diagnosis one must rule out psychoneuroses, where there are frequent complaints of dizziness. The meaning of the word to the patient has to be investigated carefully, because only if there is a feeling of movement of the patient or the environment, is the symptom likely to be of labyrinthine origin. Psychoneurotics often call dizziness their inability to concentrate, a certain thickheadedness and a feeling of insecurity. Analysis of their symptoms reveals in them other signs of anxiety.

Other states where dizziness is experienced are petit mal attacks, foci of multiple sclerosis, head injuries and local disease of the middle ear. However it is very rare for local suppurative processes to cause symptoms simulating Ménière's Syndrome.

Ménière's Syndrome may frequently show spontaneous remissions regardless of treatment. Physical and mental rest and sedative drug therapy are recommended. However the frequency of remissions makes it difficult to evaluate the effect of the therapy. (O. P.)

BLONDIN, S.: *Surgical Treatment of Arterial Hypertension*. Schweiz Med. Wchschr., 75:881, 1945.

Reports on operative treatment of hypertension are contradictory and even in the most favorable statistics the percentage of cures is not too satisfactory. The most important factor in selecting the therapy is exact diagnosis and indication.

In cases of medullary adenoma of the adrenal, removal of the adenoma may be expected to bring success. Favorable results may also be expected in kidney lesions, such as tuberculosis, ectopic kidney (occasionally), or a kidney stone, after operation or passing of the stones.

As for splanchnicus operation, the bilateral suprarenal splanchnicectomy seems to be the method of choice. Max Minor Peet, in a report on 375 cases, had 15% cures, disappearance of symptoms in 66% and improvement in 16%.

It appears evident that operation is not a generally suitable treatment for hypertension and should be considered only in younger individuals. Lian and Welti advise better sanitary regime and medication in patients where excess in work, eating, and drinking, etc., may be suspected. Very severe cases are an indication for operation, especially in the younger age

group. On the other hand if the patients are over 60, with signs of cardiac and renal insufficiency, the author advises against operation. The factor of subjective improvement is an important argument in favor of operation, because patients with incurable organic damage may obtain some relief from their suffering for the few years they still may live. (O. P.)

COLOMBE, D. AND BERNARD, P.: *Relation between Epilepsy and Ovarian Function*. Paris Medical, 32:100, 1942.

In a study of 500 cases the authors found two peaks in the frequency of epileptic attacks in relation to the menstrual cycle. One peak was at the time of ovulation and the other at the time of menstruation. The difference is such that it seems to have statistical significance. (O. P.)

BERT, J. M., AND GODLEWSKY, M.: *Morgagnis Syndrome*. Paris Medical, 32:98, 1945.

A case of the rare syndrome of Morgagni is described. The typical triad frontal internal hyperostosis, obesity, virile hair distribution. Coexisting are psychic disturbances of the type of a melancholia. In addition there are endocrine dysfunctions with dysmenorrhoea, polyuria, diabetes and a polyvisceral syndrome. (O. P.)

BOOK REVIEWS

BINGER, CARL: *The Doctor's Job*. New York, W. W. Norton & Co., 1945, 234 pp. \$3.00

This is in many respects an unusual book. It is written for the layman but is even more instructive for the expert; it is written about medicine without the pretension and halo of secret knowledge which the modern scientific medical man inherited in an almost unadulterated form from his aboriginal predecessors, from the medicine man and the witch doctor, and which only the wisest and profoundest exponents of the healing profession have ever dared to discard. Binger's thesis is that it is not alone the fault of the physician that he pretends to know more than he actually does. The suffering patient forces him to accept these illusory mystical powers. In order to retain his integrity he must either overpower his own self-critical faculties and believe in his nonexistent knowledge, thus becoming an honest charlatan, or else he must resist the patient's "constant push and pull to force us back into the rôle of magician, exorcist, and miracle worker." In the modern scientific era this is the dilemma of the physician who, the more he knows, the more he recognizes his own limitations. Science is one thing, a slowly progressing body of knowledge asymptotically approaching the "truth"; and healing is another thing, having to respond to the help seeking cry of the sufferer who insists upon immediacy. Binger's book will help all those who are trying to reconcile the requirements of science with those of

healing. The keen awareness of this fundamental dilemma of the medical profession is the all pervading undertone of this unusually wise book written about the entirety of medicine. From the writings of great physicians many apperçus and aphorisms can be quoted on this topic. This is a whole book centering around this intrinsic issue of the healing profession, written in the spirit of Hippocrates, Paracelsus, Osler, and Freud. Its style admirably reflects this basic attitude. It is unpretentious and nontechnical even when the author deals with the most intricate problems, simple but not oversimplifying.

All the essential problems of medicine, its larger aspects and many of its details are discussed in this same vein: the problem of specialization which, while it increases our skills, threatens to make us lose sight of the totality of that complex machine, the human organism; the subtle problem of choice of physician and etiquette; the all important question of the relationship of the doctor and the patient, leading over to psychoanalysis which, as a reaction to the particularism of specialization, is becoming an integral part of modern medicine; and then the culmination of this integrative trend, the psychosomatic approach, to which four chapters are devoted. In these, the strong point of this book, its wisdom and self-critical attitude appear most impressively. Here is finally an up-to-date treatise on the psychosomatic approach, which is restrained without false modesty, profound and penetrat-

ing without being technical, written with a deep conviction of its significance without the naive over-selling enthusiasm of the tyro, which is so important because we are all tyros in this field. The chapters following this central question of current medical history, devoted to convalescence and chronic diseases, prevention and socialized medicine are not anticlimactic. They are philosophical and highly practical at the same time.

It is difficult for the reviewer to estimate fully the benefit of this book for the lay public, although many parts of it cannot fail to have a thoroughly enlightening effect. However, this is a "must" book for the medical student, for the general practitioner, for every specialist, and particularly for the psychiatrist, all of whom will gain from it something which they did not receive from their medical school curricula, from their textbooks and technical journals—namely, to become conscious of all the subtle emotional, sociological, economic, and scientific implications of assuming the arduous rôle and function of the healer.

FRANZ ALEXANDER

BRENNAN, MARGARET, AND GILL, MERTON M.: *Hypnotherapy*. New York, Josiah Macy, Jr., Foundation, 1944, 85 pp.

The authors have written a very excellent and timely summary of hypnosis and its uses in brief therapy. For many years the use of this phenomenon has been restricted to either charlatans or intrepid psychiatrists who dared to brave the skepticism and disdain which their experimentation brought. Perhaps the psychoanalytic school has been more guilty than others in its almost complete rejection of this technique. With the amazing insight it has given us into human psychology, it was indeed unfortunate that this school should have abandoned a technique which bares the unconscious as hypnosis does.

To quote the authors, "It has been unfortunate for the development of hypnotherapy that it was an historical necessity for Freud to reject hypnosis. This left both its practice and theory to those who were desperately fighting the insights of psychoanalysis. The practice of hypnotherapy therefore simply followed one of two old paths: the removal of symptoms by direct suggestion, or the attempt to remove symptoms by hypnotically inducing a re-living of one or more specific traumatic episodes."

Until recent years, during which the war forced the use of brief forms of therapy, few analytically trained psychiatrists have attempted to experiment with transference phenomena, ego defenses, and resistances which are present in hypnotic states just as they are in the psychoanalytic situation. If there is to be any validity in "hypnoanalysis," it is to be found in the shortening of treatment by more readily overcoming resistances and more easily making the defense mechanisms of the ego apparent to the patient. It has been proven to the satisfaction of a number of investigators that repression is not the only defense which can be broken through.

The booklet is divided in six sections which include the historical development, the theory, the induction and susceptibility, and the therapeutic applications of hypnosis. Each subject is carefully commented upon, and the limitations of our modest knowledge are frankly admitted.

It is quite doubtful whether hypnosis will vanish at the end of the post war period. The needs for some forms of brief psychotherapy are too urgent to cast aside the knowledge and possibly the therapeutic effects which hypnosis can bring. The problems in its use remain the problem of hypnotizability which so badly limits its application, a better understanding of the hypnotic state, and the potentialities of hypnosis as a therapeutic agent. To quote, "Such research conducted within the framework of a scientific psychopathology, and carried through by a close collaboration between those trained in orthodox techniques of psychotherapy, and those exploring untried methods may result in an important addition to the available tools of clinical psychiatry."

HERBERT KUPPER

HORSLEY, J. STEPHEN: *Narco-Analysis*. London, Oxford Medical Publications, Oxford University Press, 1943.

In spite of its uneven quality, this little book deserves more attention than it has received. The author published his first work in this field in 1931, and seems to have been working actively ever since with the use of the techniques of hypnosis and of analysis of patients under narcosis.

Naive theoretical formulations mar his presentation; and sometimes his claims appear to be excessive, and the reports of experimental work are not documented sufficiently to make them wholly credible. These blemishes lessen but do not destroy the importance of the work. The author attributes his own interest in this field to many predecessors, e.g., Hadfield's studies of hypnoanalysis of war neuroses during World War I, Milligan's use of chloroform, and Starling's use of ether; and then in the years just before Horsley's own work took shape, that of Bleckwenn in 1939, and of Lindemann. It is to his credit that he does not claim originality for his work, but relates it to its historical roots.

It is significant also that the book improves as it goes along. Certain over-simplifications which occur in the preface and in the early chapters disappear in formulations of the same topics in later chapters. For instance, in the discussion of the purpose of narcoanalysis in the preface, the major emphasis is on the necessity of circumventing resistances, without any discussion of the possibility that the circumvention of resistances may at times defeat the therapeutic purpose of the procedure. Later, on the other hand, he illustrates clearly the use of narcoanalysis to overcome but not evade resistances. The author's growth is thus an integral part of the book itself. Perhaps the chapters grow out of a succession of papers written at different

stages in the author's experience. If so, it is unfortunate that they were not rewritten so as to make them consistent with his current point of view.

Because the book is not inwardly consistent, a point by point analysis of its argument would not be fruitful. However, it may be of value to pick out a few points for emphasis:

(1) One must question the somewhat optimistic assumption that barbiturates act predominantly or specifically on the hypothalamus.

(2) Evidence from other sources raises doubts as to the automatic and nearly universal influence of barbiturates on hypnotic rapport claimed by the author (p. 2).

(3) One must question the validity of the author's argument (p. 7 and elsewhere) that the persistence of normal or increased muscle tone characterizes hypnosis and differentiates it from normal sleep. (Of interest in this connection is the traditional hypnotic maneuver of ordering patients to relax.)

(4) One must question the author's use of amnesic phenomena as a direct index of a dissociative process.

Horsley's ideas on technique are developed in several chapters. The methods of hypnosis in general are outlined on page 8. The importance of the repetition of narcosis to remove the amnesias left over from preceding sessions is discussed on page 15. In succeeding pages he indicates his conviction that many individuals who cannot be hypnotized can be induced under narcosis to accept both pathogenic and therapeutic suggestions. By the former he means suggested disabilities: by the latter, rapport, hypermnnesia, and a sense of general well-being. By rapport is meant "a state of emotional dependence" which can be successfully suggested "in a great majority of cases" (p. 18); but he does not indicate here whether the phenomenon of hypermnnesia must be produced by positive suggestions or is an automatic function of the thinking process under hypnosis.

In Chapter 4 the chemistry, physiology, and psychology of the barbiturates are discussed. The author claims to have encountered only one case of idiosyncrasy in 3000 patients treated over a period of twelve years. He lists as contraindications: old age (small doses), nephritis (no long-acting barbiturates), liver disease, advanced arteriosclerosis (small and infrequent doses), any tendency to respiratory spasms, and "toxemias."

The author attempts to make a sharp distinction between narcoanalysis and the process which had been called by Jelliffe "the drug analytic methods." The latter, according to Horsley, consists of "a moderately deep sleep plus the utilization of the patient's waking remarks in response to direct questions, to effect content, rapport, and understanding. The author himself claims to have used drug analytic method in 2000 treatments; and as a result of this experience feels that it is diagnostic but not curative, and that its chief value is as a form of first aid, or for emergency diagnosis (p. 40).

Narcoanalysis as a technique he defines somewhat more specifically. He dismisses chloroform, ether, alcohol, scopolamine, and the combination of paraldehyde and medinal recommended by Hoff and Kauders. All are inferior to pentothal with its hypothetical "selective action on the hypothalamic region" (p. 41). Of this he injects a 2½% solution intravenously at a rate of 1 cc per minute.

(1) When the patient becomes drowsy the author actively attempts to induce hypnotic suggestibility and rapport.

(2) At the point at which the patient becomes relaxed and "confidential" he starts the patient on free association. These lead rapidly to the phenomena of "hypermnnesia." (This observation is borne out by the reviewer's experience with induced hypnagogic reveries; as is the author's comment that under these conditions an abundance of trivial details are recalled spontaneously.)

(3) At this point the author attempts something which he calls "synthesis," and on the importance of which he lays emphasis; but neither his meaning nor his technique is adequately described, except in terms of its goal, to wit, "new associations to restore a normal attitude to reality."

(4) The session is terminated with a period of deep narcosis.

(5) Repeated treatments are deemed essential. They may make possible simple hypnosis without narcosis, or they may make it possible to achieve the same state with diminishing doses, or with the same dose longer hypnotic states and longer sleep may be achieved. (In the reviewer's hands repetition alone does not always reduce the size of the effective dose. The reviewer is nevertheless convinced that repetition is essential, but for other reasons.)

(6) Finally, all suggestions are re-enforced during the waking state, in the process termed "re-education."

The author indicates that he realizes that transference phenomena occur regularly in narcoanalytic sessions, but he gives no indication here that he realizes the complex problems which they create or the training and techniques required to handle them effectively. The author also comments on a fact observed by others, namely, that recurrent dreams may replace the neurotic symptoms during the period of treatment before therapy is complete. This is of interest in any theoretical consideration of the relationship of dream formation to symptom formation.

In Chapter 7 the author recommends the use of narcoanalysis in the outpatient treatment of patients with (1) hysteria (especially combat induced), (2) acute anxiety states, (3) the resistances encountered during psychoanalytic treatment, (4) in the differential diagnosis of the sequelae of direct head injury, (5) in the diagnosis of doubtful psychotic states, (6) for tics of doubtful origin, (7) in the recognition of simulation and malingering.

Chapters 8 and 9 are devoted to a discussion of the use of narcoanalysis in wartime and the rôle of abreact-

tion in narcoanalysis. Several pages are devoted to a critical evaluation of Jung's point of view, the problem of dissociation and of "psychic autonomy," an incomplete effort to formulate a concept of abreaction, and finally (p. 80) an enunciation of sound essential principles: (1) that since any amnesia is protective, any penetration of it must release severe affects for which the patient must be adequately prepared; (2) that subsequent sleep is helpful; (3) that post-hypnotic suggestions can avoid a restoration of the amnesic blocks.

Chapter 10 on transference problems is the most mature and solid theoretical chapter in the book. Here the author indicates his realization that transference forces are as inevitable and universal in narcoanalysis as in any analytic process. The excellent case data on page 89, *et seq.*, illustrate the manipulation of transference relationships in narcoanalysis in order to solve obstacles in the positive and negative initial phases of the transference, in the transference neurosis, and in its therapeutic resolution.

Chapter 11 presents interesting and challenging data from a case of schizophrenia, which unfortunately is too incomplete to evaluate.

Chapter 12 discusses narcosis in dream analysis, with a reference to the occurrence of many universal birth and rebirth dreams in rather stereotyped forms, and to the fact that dreams which recur tend gradually to replace the neurotic symptoms. A sequence of thirty-two dreams from one patient is given here without interpretation.

Chapter 13 contains a somewhat formal discussion of the problems of simulation and malingering; and Chapter 14 winds up with a brief optimistic statement of the possible future place of narcoanalysis in psychotherapy.

All who are interested in future developments and modifications of psychotherapeutic and analytic techniques can find in this uneven book much that is stimulating and useful; and will only feel regret that it is not more clearly organized or more fully documented, and that not all of it is written on the same mature plane as are the best of its chapters.

LAWRENCE S. KUBIE

GRINKER, ROY R., LT. COLONEL, M.C., A.A.F., AND SPIEGEL, JOHN J., CAPTAIN, M.C., A.A.F.: *War Neuroses in North Africa. The Tunisian Campaign (January-May, 1943)*. Prepared and distributed for the Air Surgeon by the Josiah Macy, Jr., Foundation, September, 1943, 300 pp.

A detailed review of this important contribution to the literature of the war is not needed at this late date, since the same authors have recently brought out further studies in the same field. Nevertheless, it may be useful to indicate some of the essential contributions of this basic report. On page 7 the authors acknowledge their indebtedness to Major C. R. Kenton of the Royal Army Medical Corps for his cooperation, and for the facilities of the British hospital which were

made available to them for their work with pooled American and British casualties.

The patients were seen at a base hospital several hundred miles behind the front. Some were from the ground and air forces, and some civilians; and their breakdowns had occurred during periods of triumph and power, and of loss and defeat. Some represented the cumulative manifestations of a process which had begun months before. Some were acute, the final breakdown beginning from two to ten days prior to treatment. Thus the report rests on a broad base, and includes a wide cross-section of the problem of war neurosis.

The clinical pictures are divided into ten groups (p. 8a); but the authors emphasize repeatedly the rapid changes in the clinical manifestations with time and distance from the front. The major difference found during the transition to the rear is the decrease in visible anxiety and the increase in depression. The acute "pseudo-psychotic" state is regarded as a "severe regression" with or without paranoid features. Differences between patients are ascribed largely to differences in quantities of anxiety (p. 11), and to the recovery of the ego (p. 17); and the end result is said to be the same whether a man breaks at once or after long combat experiences (p. 31).

From a theoretical point of view one may question whether we are able to estimate or measure quantities of anxiety, Ego strength, and Ego recovery, and one may be disturbed by certain logical defects and circular reasonings which develop from this assumption. Such theoretical considerations, however, are relevant only to the interpretation of the clinical data, and do not lessen the value of the clear clinical delineations. This first section of the book is rich in vivid, clinical vignettes, although some are too short perhaps, and omit important items; but undoubtedly this was unavoidable under the conditions of the work. Certainly these are among the best clinical presentations in the field that are available to date.

The authors' therapeutic credo is stated on page 44: "Pentothal brings back memory, and words to express that memory, and finally the emotions linked to the recollections." Pages 66 to 69 give an excellent illustration of the successive levels of unmasking during a succession of pentothal interviews, working backwards and forwards between the battle, home, early life, and again the battle scenes.

In view of the therapeutic optimism sometimes attributed to the authors it is important to note that on page 82 they indicate that they are not as hopeful of the durability of returns to combat duty as are some other authors. General statistical analyses of the results of treatment of 1,258 patients in the 95th General Hospital (p. 230) are of special interest. Seventy-two percent were returned to some kind of duty; but less than 2% to combat duty. Furthermore, they indicate clearly (p. 130) that relief from operational flying is not enough, in that it relieves only the phobic component of the total picture. On the other hand one

may question the validity of the argument (pp. 75-76) that a failure to clear up under pentothal is evidence for organic brain injury. Our knowledge of the factors underlying resistance to treatment is insufficient to justify this position.

The section on etiology (which begins on p. 131) is not wholly satisfactory, for the reason that insufficient material was available on early history and personality. The authors emphasize the importance of evaluating underlying character structure rather than individual symptomatic flurries. In this connection, therefore, some of their impressions are of interest: (a) With rare exceptions, individuals with a previous psychosomatic history seem to be sure to flare up. (b) Of those who had shown previous manifest neurotic anxieties, some collapse quickly and some do very well in combat. (c) All passive dependent characters, and all over-compensated "tough" guys, and all compensated schizoids do very badly. (d) The obsessional compulsive tends to break late and only after great strain. Clearly the psychopathological setting which underlies specific anxiety mechanisms must be taken into account in estimating vulnerability.

Further factors in resistance to breakdowns are: leadership; country morale; group morale; group spirit; the cumulative impact of repeated alarm signals (sights and sounds of combat); undischarged tension; and last and least important, physiological fatigue and depletion.

On page 143 some of the factors influencing prognosis are discussed. To the reviewer this seems to be weakened by a methodical and theoretical defect; *i.e.*, a tendency to mix practical, situational, clinical, and theoretical concepts, and again to imply that we possess the means of estimating quantities of anxiety, of Ego-strength, and of repressed hostility.

Details of treatment are presented on pages 159 *et seq.*: slow injections, counting, verbal stimulation with battle dramatizations when needed to force the soldier back onto the battle field, no effort at formal hypnosis but sometimes "commanding" somatic symptoms to disappear, the use of pentothal to uncover concealed anxiety in pseudo-recoveries (p. 170), and the varying techniques of termination (p. 171) sometimes spontaneously, sometimes having to "drag them away from the battlefield."

It seems probable that these differences must be connected with important differences in the dynamics of illness and of treatment. However, the implications of differences in technique are not developed; and theoretical interpretations of the effects of treatments leave something to be desired. On page 172 the phrase "the ego has been acting" is used, or again "the ego is unable to make the distinction," or again it is emphasized that the patient must be told that the battle experience is in the past. All of this is perplexing. What is this "ego" which does not "know" whether events are past or current? In a patient with a butterfly phobia, is it the "ego" that does not know that a butterfly is harmless? Does it help that "ego"

to assure it of the harmlessness of its phobic stimulus? Is this a matter that can be understood by speaking of the knowledge or strength or weakness of the "ego"? What do these anthropomorphic and muscular terms mean when applied to ego activities? Here again the review's quarrel is not with the observations, but only with the language which clothes the interpretation.

On page 173 there is an incomplete but challenging discussion of the goals and methods (or levers) of brief psychotherapy.

- (1) The release of tensions by manipulation of the environment.
- (2) Strengthening the ego by abreaction.
- (3) Modifying the super-ego through opportunities for new identifications.

A series of manoeuvres and objectives are then described (pp. 175-215):

- (1) Establishing transference by playing the rôle of the kind protector. (About this many questions might be raised.)
- (2) Prompt interruption of apparent secondary advantages. (This discussion leads into the difficult problem of malingering).
- (3) Desensitization through repeated rehearsal of traumatic experiences.
- (4) Increasing the tolerance of the ego for guilt and anxiety through absorbing strength and support from the therapist, etc.
- (5) Neutralizing the super-ego by "attacking its identifications" (p. 184), and by reassurance and moral upbuilding.
- (6) The neutralization of passive dependent needs (p. 189), first by indulging them, then by weaning the patient from them, and finally by treatment of those who cannot be weaned.
- (7) The resolution of conversion symptomatology.
- (8) The release of unconscious hostility (p. 195).

A series of cases is described (pp. 215 *et seq.*) who were treated both with narco-synthesis and with convulsive treatment. This was done because the patients had failed to recover with narco-synthesis alone. Theoretical support is offered (p. 224) by arguing that in these cases "the ego is incapable of handling strong, aggressive, hostile feelings except by the method of repression with some depression." The implication that convulsions help the ego suddenly to become strong enough so that depression and repression are no longer necessary, hardly seems to be an adequate explanation of the rationale of this form of therapy.

Continuous sleep is dismissed as disappointing (p. 225).

Emphasis is laid on the importance of making men as well as possible before returning them to the Zone of the Interior. Occupational therapy must be of use to the Army to be of use to the men. Group treatment is dismissed with few words (p. 228) as of value chiefly in lessening shame and fear. Hypnotism is similarly dismissed (p. 229): "We did not use hypnotism,

believing that simple abreaction never enabled the patient to master his emotional problems." To the reviewer this is another perplexing statement, and indicates that there must be some discrepancies between the authors' use of the concepts of hypnosis, abreaction, and narco-synthesis and the way in which others use these terms.

On page 256 the authors undertake a through presentation of their theoretical conceptions of the dynamics of illness, both on the psychodynamic and the physiological level. A full discussion of their interesting and controversial positions would take too many pages to include in this review. It is of significance, however, that they arrive at a psychobiological conception involving a phasic interplay between hypothalamic and cortical functions (p. 263), with the formation of hypothetical closed circuits between the two. Furthermore they believe that pentothal acts specifically and therapeutically upon this diencephalic-cortical relationship (p. 285). This theory is then retranslated into metapsychological terms, with the ego again as the chief actor in the drama. The reviewer can recommend this section of the book for careful but critical study. It is mature, forceful, and stimulating. One need not ask it to be completely convincing.

LAWRENCE S. KUBIE

GRINKER, LT. COL. ROY R., AND SPIEGEL, MAJOR JOHN P., M.C., U.S.A.: *Men Under Stress*. Philadelphia, Blakiston, 1945, 484 pp. \$5.00.

The "Atomic Age," years in the making, has burst upon us with the impact of the explosion which heralded its debut. At the disposal of weak, selfish, aggressive, wayward mankind is new and limitless power. Fortunately, another age has also opened, very quietly, but with pangs that have not yet subsided. This age is also a product of science, which is in essence the systematic study of reality. It is the age of scientific understanding of man's own nature. It offers a ray of hope that man's knowledge of man may yet forestall the use of atomic power for even vaster deeds of cruelty and destruction than those man has wreaked upon his own kind in the past.

One of the signs that this new science, initiated by Freud, can be vigorous and practical and develop new leadership, is this solid study of men under stress. Reading it, one sees how psychoanalysis, the study of human motivation and feelings at all levels, which began to integrate itself with medicine through developing "psychosomatic medicine," now emerges as a potent practical instrument for understanding and treating the emotional disorders caused by the stress of war. This step gives to it, as to all psychiatrists in the Service, a healthy and indispensable contact with great numbers of men and with the currents of national life. The war has facilitated its development as an eminently practical tool and has broadened its contact with reality as well as heightened its appreciation of the "ego." Its latent potentialities are becoming actual. What has been and is being learned in the "laboratory"

by the intensive prolonged study of individuals is now capable of being applied on a wide scale in a practical way. The therapy is no longer identical with the science. The science of depth psychology has now advanced to the stage where it forms a firm body of knowledge upon which various therapeutic techniques can be based, just as physiology forms such a basis for medicine.

Thus the authors, with this training in the fundamentals of the psychology of the emotions, are able to turn the light of psychodynamics upon all the phases of the aviator's career:—the appeal of flying, the motivations and the kinds of men selected, their organization for combat and what happens to their personalities, what keeps them fighting and what makes them break, what happens when they break and how to treat them, their reactions to returning home and to treatment in this country, and, lastly, a discussion of what can be learned for civilian psychiatry and a general social interpretation of the returning veteran.

Such a comprehensive volume cannot be succinctly summarized. Only a few observations can be given. The authors' excellent analysis of morale and motivations for combat lead to the conclusion that it is chiefly a matter of group loyalty. The individual neurotic reactions are largely determined by the man's previous emotional make-up and disorders; and breakdowns depend upon this also: "Our experiences force us to conclude that war neuroses are reactions of persons ripe to respond in an individual manner to a particularly meaningful stress. This way of reacting is discovered, not near the battle field but in a safe and secure hospital in this country (cf. cases 17, 18, 19). Returnees may have persistent symptoms or may develop difficulties for the first time, yet are no different from those ill for the first time in a combat zone. To recapitulate: every war neurosis is a psychoneurosis, since the old unsolved conflicts of the past are stimulated by stress to assist in the production of a neurotic reaction, and in its persistence, once it is formed."

The breakdowns, reflecting the essential dynamics in each case, are grouped and discussed as: 1) Passive-dependent states, 2) Psychosomatic states, 3) Guilt and depression, 4) Aggressive and hostile states, and 5) Psychotic-like states.

In the passive-dependent states, the main point is usually that the man cannot tolerate being abandoned to danger and behaves like a child exposed alone to a hostile world. Like the hysterics, which attempt solutions for conflict and escape from anxiety by blocking out a motor or sensory system, psychosomatic states represent "the exaggerated physiological concomitant of the emotion blocked by the unresolved conflict" (p. 253). (But what, for example, of the symbolic giving, taking, and attacking in certain gastrointestinal disorders?)

Guilt is largely over unconscious competitiveness with shipmates and is mobilized by their death or by leaving them to return home. "Regardless of the origin of the depression, it represents the ego's conscious or

unconscious reaction to the fact that it has been neglected, rejected, betrayed or punished by an impersonal fate, by living figures in reality or by its own ego-ideal. In this statement, we deliberately pass over for the time being the origin of such feelings. We do this because too many psychiatrists plunge into the handling of the case with the bias that the man has a depression, ergo he has repressed hostility. Actually the first step in handling the emotions of depression is to ask the question, 'Who or what is hurting this boy?' By doing so, we can get a sharper perspective, not only of the conscious forces at work, but also of the task, failures, and success of the ego."

Aggressive reactions are very frequently the result of anger turned against the Army because of feeling like a child abandoned to danger. Often it is mobilized by failure or loss of group morale or organization. Hardly ever is sustained hostility maintained against the enemy: "To enumerate the external causes of the hostile-aggressive attitude to authoritative figures . . . we may make the following list:

1. Loss of confidence or trust in leadership.
2. Loss of group morale.
3. Hostility to the army from other rejections.
4. Mobilization of old repressed conflicts.
5. Mobilization of repressed hostility from a current conflict.
6. Reaction to loss of dependent gratification.
7. Hostility of psychopathic personality in order to evoke strict supervision.
8. Hostility of dependent personality to gain attention.
9. Defensive reaction against unconscious homosexuality.

In none of these patients do we find expression of hostility toward the enemy."

The psychotic-like states are found to be merely exaggerations of the neurotic and do not carry any sinister prognosis in these cases.

The authors state that: "To understand the dynamic factors underlying war neuroses observed in this country among returnees, one must be familiar with their genesis overseas. But that is not enough; the effect of combat on soldiers who do not develop overt illness overseas must be known, because many soldiers become emotionally ill only after returning home, although they have been prepared for this turn of events by their experiences abroad and in combat. The combat veteran who succumbs for the first time at home, long after he has left the dangerous atmosphere of combat, is also suffering from the effects of war." Overseas the entire interest of soldiers and psychiatrists is centered on the traumatic effects of combat for it is difficult to focus attention on personal factors when the reality is so over-powering and produces fear in everything. The essence of the authors' formulation of the war neurosis, which, in the reviewer's opinion and experience, is completely accurate, is, that in spite of the features which war neuroses

have in common and which distinguish them from all others, they are in essence psychoneuroses. Sick or well, everyone reacts to the stresses of the harsh realities of war according to how his previous psychological patterns have prepared him, and reacts only to the proper quantities of the specific stimuli to which he is sensitized. After the initial blow the reaction is internalized and repetitive according to the previous pattern of the personality. The war neuroses are not equivalent to the traumatic neuroses of civil life. The authors inevitably find what this material again and again reveals, namely that the catastrophic nightmares cannot be dismissed as a general technique for mastering anxiety but are an expression of the current neurotic attitudes of the patient.

In the chapter on psychotherapy the advances of psychiatry since the last war are clearly apparent. For here the point is made that the only logical therapy depends upon unearthing the unconscious sources of the anxiety so far as is possible and educating the ego to deal with them rationally. The names of the authors are so linked with the use of sodium pentothal and this drug is so widely used as a magic treatment, a form of chemo-therapy rather than as a means of facilitating causal treatment which is based upon a thorough dynamic understanding of the patient, that the following sentences should receive widespread attention: "The indications for the use of pentothal in the treatment of returnees are largely concerned with time. In almost all cases the same material and the same emotional release can be obtained by psychiatric interviews while the patient is fully conscious. This has been adequately proven in our work with large numbers of patients. In the brief period available for therapy in the military setting, the uncovering of anxieties and conflicts and the production of adequate abreactions require the aid of some shortcut to overcome resistances. Since the military psychiatrist is short of time for individual treatment, sodium pentothal is frequently utilized for the diagnosis and treatment of our patients." "As a general rule pentothal should be first used only when the utmost has been obtained from the conscious patient—when the physician feels that the pathogenic material is not conscious and knows from experience that subsequent insight will take a large amount of time. When resistances occur, pentothal may be used at that point. Probably only half of our patients require the drug."

"No patient is given pentothal treatment without adequate preliminary interviews, until a good grasp is obtained of the factual material regarding combat and past life, or until a good transference relationship has been established by the physician." "We have stated many times that the emotional expressions evoked under the influence of pentothal must be considered usually as an abreaction, which is rarely curative in itself but is the necessary beginning to the attainment of insight. Subsequent interviews, interpretations and 'working through' are necessary in almost every case."

Of special pleasure to the scientifically minded physician will be the authors' unswerving insistence upon rational treatment and their ability to penetrate to the essence of the various therapeutic methods in terms of the emotional dynamics of the patient.

No psychiatrist and especially no psychoanalyst can spend months and years treating these men without tremendously increasing his understanding of psychodynamic processes, particularly of the ego. The facility and the insight which he gains are bound to broaden his views and to increase his effectiveness in treating civilian neuroses. This book should help to make this experience available to civilian psychiatrists, and the whole war experience should have a healthy effect on both psychoanalytic and non-psychoanalytic psychiatry.

It must be especially noted that this book deals almost exclusively with combat crews of the air force and hence focuses upon the acute danger as the precipitant of the neuroses, for this overshadows all other stresses to which these men are subjected. Cases of a different type are encountered in other branches; for example, in the Navy, where other stresses of many different kinds, such as long months of isolation at sea, are often more potent than combat in causing breakdown. Nevertheless, the central formulation advanced in this book reveals the essence of the neuroses of war, if the reader bears in mind that fact that other stresses than actual combat can cause neurotic breakdown.

A few criticisms could of course be made, as they could of any book, but none of any consequence to this major contribution.

The book will deepen the reader's general knowledge of psychodynamics and, through the frequency of functional organic symptoms as well as the special chapter devoted to this subject, of psychosomatic states. It is written in a superior style and is outstanding in its penetration and thoroughness. It is to be hoped that training in emotional dynamics will become more widespread so that many men of high caliber will be capable of such contributions and that the same energy which has been evinced here in studying some of war's most tragic results will be devoted to the problems of peace and the causes of war.

LEON J. SAUL

HASTINGS, DONALD W., MAJOR, M. C., U. S. A., WRIGHT, DAVID D., CAPTAIN, M. C., U. S. A., AND GLUECK, BERNARD C., CAPTAIN, M. C., U. S. A.: *Psychiatric Experiences of the Eighth Air Force. First Year of Combat (July 4, 1942-July 4, 1943)*. Prepared and Distributed for the Air Surgeon by the Josiah Macy, Jr., Foundation, August, 1944, 307 pp.

This is a study of three major topics: the genesis of operational fatigue, its treatment, and the personality factors which determine the vulnerability of the flier to the stresses of combat aviation. None of these basic and important topics is treated convincingly or clearly, or with consistency. One closes the volume with a feeling that the authors were unable to clarify their own thoughts, or to reach decisions about these difficult

and controversial issues. Their indecision is reflected in the book.

In the first section of the book a distinction is drawn and implied between the aviators who broke down early, the so-called "psychological failures" (p. 38), and those who broke only after prolonged combat, the so-called "operational fatigue" (p. 67). The former are treated moralistically with emphasis on a hypothetical deficiency of motivation. There are no adequate studies of individual representatives of this group, and no discussion of the many phobic sensitivities which may render otherwise sincere, earnest and courageous individuals vulnerable to early collapse. In the latter group emphasis is placed on the rôle of fatigue at the end of a tour of missions, overlooking the urgent reawakening of the hope of surviving which becomes stronger as the end of the tour comes near, with the heightened tension and vulnerability which this brings. Throughout, there is an obvious effort to escape any implication that these are emotional illnesses, as though emotional illnesses were infra-dig among air force personnel. Nonetheless on page 34 the authors are forced to reach the safe conclusion that operational fatigue is 50% fatigue and 50% emotional. Thus they succeed in offending no one.

The statistical treatment which follows in the succeeding pages is grossly inadequate on several counts. The data are not presented in relation to the total number of men in each category; there are too few individuals to treat on a percentage basis; and there is no contrasting data on those who fail to break.

The section on treatment emphasizes the rôle of narcosis. Apparently to give some rational support for this treatment there is a tendency at several places to liken those illnesses to manic-depressive disturbances. The grounds for this surprising statement are not given. On page 81 there is a brief reference to "administering psychotherapy where indicated," with some hints that psychotherapy consisted essentially of reassurance, and the talking out of symptoms, but with no "uncovering" techniques. Nevertheless, in the presentation of the results of treatment on page 109, it is claimed that of those suffering from operational fatigue 70% recovered and returned to combat duty. The durability of this recovery is not discussed; and the figures themselves are suprisingly divergent from reports from other sources.

In a study of 150 air crew men who had completed their tours of duty successfully (p. 113 *et seq.*) 95% of these are reported as suffering from operational fatigue! Fifty per cent gave some history of earlier instability (p. 125). This leads to a discussion of personality types (p. 127) which is over-simplified with an indefensible and confused use of such terms as "extrovert," "introvert," and "rigid," in senses which are wholly at variance with their accepted meanings. An argument is then advanced that those with poor backgrounds did as well as those with good backgrounds. Nevertheless, on page 147 and 148 it is pointed out that those with predisposing factors had severer

symptoms, especially those who gave evidence of previous maladjustments in the psychosexual sphere. The implications of this somewhat parenthetical statement are far-reaching, but nowhere receive adequate consideration.

In general the characterization of the disturbances under consideration are on a superficial plane. The only points of special interest which are brought out are the occurrence of extreme aggressiveness, which may prove to be significant for postwar readjustment (pp. 138-139); and the occurrence of excessive concern with excretory obscenity (p. 142). No detailed clinical or dynamic studies of either of these phenomena is presented, beyond the somewhat pointed statement that "certain colleagues might make much of this." With this the reviewer can only concur whole-heartedly.

LAWRENCE S. KUBIE

DRAPER, GEORGE, DUPERTUIS, C. W., AND CAUGHEY, J. L., JR.: *Human Constitution in Clinical Medicine*. New York, Paul B. Hoeber, Inc., 1944, 284 pp. \$4.00.

The authors, who are engaged in the work of the constitution clinic of New York's Presbyterian hospital, view the "panel of personality" from four aspects: morphology, physiology, immunity and psychology, the first two receiving the most emphasis in this work. Since *constitution* has many meanings in medicine, it would be well to say that the term is taken to represent "that aggregate of inherited characters modified more or less by environment which together determine the individual's reaction to the stress of environment."

The first several chapters encourage the medical student, to whom the book is primarily addressed, to observe the patient—his body form, facial expression, reactions to the examination, etc.—and instruct him in obtaining a "clinical biography" instead of a routine history. Genetics, growth and development are discussed, along with a very interesting presentation of the "mosaic of androgyny." Impressions which most clinicians have gained concerning the body form of individuals with certain diseases are substantiated by extensive anthropometric data collected from nearly a thousand patients.

Two chapters on physiologic aspects of constitution are easily the most valuable to the student, enabling him to integrate academic knowledge with clinical problems, and making him wary of accepting any one or more laboratory tests as the whole patient. The remarks about the indivisibility of the autonomic nervous system are especially welcome.

A dozen cases are presented to show the clinical use of constitutional studies, and since several of these are of peptic ulcer, the psychosomatically-minded reader can swiftly evaluate Draper's technique by perusing them. Here, almost for the first time, are introduced psychologic considerations, but these remain on a superficial "mental hygiene" level. To the authors, "mind" remains "mysterious" and "obscure," and "the fact that in man there still exists poor integration between

reason and emotion and that the latter is influenced more by the circuitous language of symbols than by logic," is deplored.

Throughout there is an undercurrent of therapeutic pessimism, peptic ulcer, for example, representing an "inevitable product" in certain susceptible individuals. "If one accepts the notion that an ulcer-bearer's emotional pattern is a correlate of his other constitutional components one cannot expect to achieve much alteration of it."

Unfortunately, this subtle defeatism is what the embryo physician is liable to take away from the book, and for this reason alone I would regret having it fall into the hands of students. The neglect of psychodynamics in a work purporting to be an organism-as-a-whole approach to man, is an anachronism in 1944. Those who can discount this, along with the therapeutic pessimism, will find the morphologic and physiologic clinical discussions of real interest.

Readers of this journal may be amused, in passing, to learn that Draper *et al* feel "that the only dichotomy in the organismal totality or constitution is projected upon it by the split word-symbol 'psychosomatic.'"

LOUIS PAUL

HOOTON, EARNEST. *Young Man, You Are Normal*. New York, G. P. Putnam's Sons, 1945, 210 pp. \$2.50.

"Young Man, You Are Normal" is Mr. Hooton's popular presentation of the findings of the Grant Study conducted by Harvard's Department of Hygiene under the guidance of Dr. Arlie Bock over a period of six years. On the 268 sophomores selected as normal because of their ability to "get along" at Harvard an impressive array of physicians, anthropologists, psychiatrists, physiologists and sociologists have extended their arts. The group investigated has been minutely measured and observed as to physique, health, intelligence, personality, background, taste, activity, etc.

The reader whose hopes are aroused by Mr. Hooton's cheerful title may well face disappointment for when the final count is taken and the statistical machinery has rolled to a standstill the "normal" young man emerges as predominately tall, strongly masculine, well-to-do, Protestant and not excessively intelligent. One cannot escape the impression that prediction of success for such an one in the average American university could have been arrived at more economically than by the elaborate Grant Study.

It is rather clear that the group of specialists who conducted the study are much more aware of the limitations of both their sample group and their findings than is Mr. Hooton himself, in spite of repeated avowals of his own caution in evaluating the material. It is the section headed "Conclusions and Speculations" (the author absolves the Grant Study of all responsibility for the opinions expressed here) that the reader is apt to find most disquieting. In the discussion of racial antagonisms for example, we are told that "It is these inferiors (the ignorant, the stupid and the vicious)

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of every race . . . that bring all the members of their own group into disrepute by their individual behavior. . . . Such a formulation seems a sorry summary of the bitter lessons about the socio-political roots of racial discrimination that have been learned in the past five years.

Mr. Hooton's hand is best shown by the following statement which is quoted in full: "I have attributed the diffusion of harmful genes throughout the population to the obsolescence of natural selection. I mean by this that medical science has become so skillful in preserving and patching up the physically and (probably) the genetically unfit that an unconscionably number of them not only survive to maturity but also perpetuate their infirmities by breeding. However, the blame for this catastrophe should not be placed upon the shoulders of the medical profession, but rather upon a society that demands the preservation of all human life, however worthless. Probably indiscriminate charity and the kind of humanitarianism that requires mental defectives, criminals, insane, and constitutionally inferior to be supported at the public expense when they are incapable of caring for themselves, are the most potent causes of the genetic deterioration of civilized populations."

It is disheartening, at the end of World War II, to meet again, in our own country, the kind of rationalization that helped precipitate it.

VERNON CLARK

REICH, WILHELM: *Character Analysis*. New York, Orgone Institute Press, 1945, 328 pp. \$4.50.

This is the second edition of Theodore Wolfe's translation of Reich's *Charakter Analyse*, first published in 1933. According to Reich's subtitle, it is a book primarily intended to furnish psychoanalysts in training or practice with "newer" orientations in the theory and technique of their specialty, and the greater part of the volume is devoted to this purpose.

Some of Reich's points are of general interest: for instance, he holds that the patient's total character rather than merely his presenting symptoms are the proper concern of every analytic process, and that the personality cannot be naively divided into Id, Ego and Superego, libidinal "stages of development" or separate "levels" of function. Even more earnestly, he contends that Freud's concepts of the primary "death instincts" (Thanatos) are not only logically unnecessary but biologically misleading, since masochism and its related phenomena are covertly hedonic strivings, whereas sadism, far from being a "drive toward death turned outward" is a defensive reaction against anxiety-ridden needs for love or dependency. From the standpoint of technique, Reich goes beyond Freud's *topical* rule that the "unconscious must be made conscious" and stresses the *dynamic* approach of working through the patient's resistances according to the *economic* balance of motivations and defenses in the individual case. Similarly, he holds that since an analyst's every word and act is an expression of an intricate

balance of a vast complexity of unconscious determinants, each of which has a bearing on the constantly changing analytic situation, no single "formulation" can ever be either complete or therapeutically determinative. Instead, the analyst must discard the recently recrudesced mirage of "complete passivity," select his interpretations of content and transference (patient-physician relationships) with consummate skill, and be prepared for a contingent, fluid and dialectic course of therapy. Moreover, the analytic treatment cannot be considered effective until the patient's schizoid "contactlessness" has been adequately bridged and the constricting facets and meshes of his "character armor" have either been shed or at least rendered comfortably pliable.

Thus far, Reich's theses—when they can be delivered from his peculiarly redundant, esoteric and polemic writing—appear cogent and reasonable. It seems strange, of course, that orientations so obvious should need emphatic restatement as late as 1932, but it must also be remembered that they have not penetrated into certain psychoanalytic quarters even today. And yet, inextricably imbedded in Reich's dynamic and holistic thinking is a monothetic absolutism as rigid and uncompromising as any that can be found in the most orthodox analytic writings. To quote directly:

p. 5: ". . . every neurosis is based on unresolved conflicts which occurred before the fourth year of life."

p. 127: "From the economic point of view the task . . . is that of concentrating all object libido in a purely genital transference."

p. 267: "Sex-economic considerations force us to stick to a strictly prescribed path which begins with the dissolution of the pregenital and negative attitudes and ends with the concentration of all the liberated psychic energy at the genital apparatus. The establishment of orgasmic potency is the most important goal of therapy."

In effect, Reich still contends that all neuroses are essentially disturbances in the attainment of sexual orgasm, and that their cure must revolve about the re-establishment of this function. In fact, nowhere in his writing is there a hint that he is acquainted with the wealth of evidence from clinical experience, war psychiatry, animal experimentation and other sources—evidence that has revealed the protean biologic, experimental and adaptive processes that play a rôle in every pattern of behavior, "normal" or "neurotic." Yet to support his position he invokes perhaps the most outworn *argumentum petiti principii* in the analytic sanctum, to wit:

(p. 270): "A person who has not gone through a character-analysis is unable to criticize its findings, simply because he lacks the sense organ for it . . . the genuine orgasmic sensations which make their appearance for the first time with the involuntary contractions of the genital musculature."

Even here Reich might still be credited as an inordinately narrow but sincere pleader for a highly specialized approach to the dynamics of certain behavior dis-

orders, were it not that throughout the text cryptic passages appear that seem to transcend biologic fact and scientific reasoning altogether. Again to quote directly:

p. 37: "... compulsive talking . . . is . . . nothing but a biological manifestation of a chronic spasm of the deep muscles of the neck and throat."

p. 55: "The patient complains about affect-lameness because of a block in his plasmatic currents and sensations."

p. 272: "The living 'orgonotic system,' the 'bio-apparatus' represents nothing but a special state or concentrated 'orgone' energy. . . . 'Orgone' is a visible, measureable and applicable energy of a cosmic nature. . . . With hypothesis . . . one cannot charge blood corpuscles or destroy cancer tumors; with orgone energy, one can. . . . A block of the orgonotic pulsations, say in the throat, makes the most complicated problems of oral sadism understandable in a simple manner."

As Reich himself complains, he was expelled from the International Psychoanalytic Association in 1934 because "its leadership no longer wished to identify itself with my concepts." Elsewhere in the book he implies that this expulsion really occurred because Freud suspected him of subverting his theories to Communist policy. In either case, the reader interested in the social implications of psychoanalytic metapsychology will find no apparent recognition of the rôle of cultural or economic factors in neuroses other than a periphrastic lament that current restrictions prohibit the free expression of "genitality." All in all, the reviewer must regret that this curious mixture of analytic insights, bizarre formulations and mystic fantasies presented as facts, reverting as it does to the gaucheries and extravagances of the early years of psychoanalysis, may even now be mistaken for, rather than contrasted with, the increasingly objective, biologically orientated and scientifically valid organon of behavior theory toward which psychoanalysis is striving.

JULES H. MASSERMAN

SCHEINFELD, AMRAM: *Women and Men*. New York, Harcourt, Brace & Co. 144, 453 pp. \$3.50.

The subject matter of sex has long been saturated with artistic pleasure and educational anguish. We have been particularly slow in clearing this field for dispassionate inquiry. Much is still to be done; the fascination in our theories is not always their content of truth. And when the topic is presented to the general reader, the absence of heavy technical detail brings the erotic aspect into sharp relief.

The present volume is a notable exception to this rule. Mr. Scheinfeld is a conscientious and skillful popularizer. He gives a clear and well-organized account of the normal and abnormal, developmental, structural, functional, directional, and social characteristics of the two sexes, without gross errors or concessions to popular fancy.

This book is a service to the intelligent citizen; by improving the cultural climate, it is also a help to the man of science.

SANDOR RADO

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BODY DISPROPORTIONS AND DOMINANT PERSONALITY TRAITS *

CARL C. SELTZER, Ph.D.

THE DISPROPORTIONS

The relationship between the morphological structure of individuals and various aspects of their total personality has been the subject of numerous studies over a long period of time.¹ However, the bulk of these researches has been oriented towards pathology, physical and mental. Comparatively little is known concerning the relationship of physique and personality in normals, and more particularly in normal adults.

The work of the Grant Study of Harvard University has been directed toward fulfilling the need in our knowledge of the normal person.² Established in 1938, the Grant Study has centered its investigation on the total personality of the normal young male adult. The approach has been clinical, and it has been carried on cooperatively by persons trained in medicine, physiology, anthropology, psychology, psychiatry, and sociology. The work of the physical anthropologist has been mainly concerned with a study of the variations in the physical structure and appearance of normal young men, and their relationship to other characteristics of the individual. The methods of morphological description and classification utilized included a large series of measurements, proportions, morphological observations, somatotype ratings, and an estimate of masculine component.

The Grant Study research thus affords an unusual opportunity for the study of human constitution. The presence of a variety of data in addition to the anthropological makes it possible to relate the physique of the individual to various component parts of his personality. The present report deals with only one aspect of this work which has yielded interesting relationships between physique and personality; that is, the element of disproportions.

*From the Grant Study, Department of Hygiene, Harvard University.

¹For an extended review of this subject and excellent bibliography, see Tucker, W. B. and Lessa, W. A. *Man: A Constitutional Investigation*. Quart. Rev. Biol., 15:265-289, 411-455, 1940.

²For a description of the work of the Grant Study see Wells, F. L.: *A Research Focused upon the Normal Personality: A Note. Character and Personality*, vol. 12, no. 4, pp. 299-301, 1944; Heath, Clark W. et al.: *What People Are*. Introduction to the work of the Grant Study, Harvard University Press, 1945; Hooton, E. A.: *Young Man, You Are Normal*. Putnam, 1945.

The frequency curves of a number of indices of body proportion were found to exhibit characteristic patterns for certain of the dominant personality trait groupings. There was evidence of skewness in a unilateral direction for several of the body ratios. Figures 1A and 1B illustrate this condition.

In figures 1 and 2, the frequency curves of the chest depth-biacromial index for four personality trait groupings are compared with the curve of the total series. In the case of the *less well-integrated* and *lack of purpose and values* groupings (fig. 1A and 1B), skewness of the frequency curves for this index is readily apparent. By contrast, the *well-integrated* and *pragmatic* series (fig. 2A and 2B) show close similarity to the total series frequency curve. There appears to be a greater frequency of individuals with shallow chests relative to shoulder breadth in the *less well-integrated* and *lack of purpose and values* groupings than in the series as a whole.

The condition here illustrated was observed to be a recurrent pattern in other body ratios for certain dominant personality traits.

That part of the frequency curve of each body ratio which encompasses the element of skewness from the total series curve has been designated by the term *disproportion*. For the purposes of this paper, *disproportions are values of an index which are extremely divergent from the mean, usually in one direction*. Thus, the possession of a head which is very large relative to the chest size is considered to be a disproportion. The combination of wide shoulders and thin legs is also a disproportion. Other disproportions include the combination of very broad hips relative to shoulder width, a flat chest relative to shoulder width, very broad hips relative to chest breadth, a broad face relative to chest width, a large hand relative to total body size, etc.

The following list of disproportions and their tentative critical levels has been found to be useful in the Grant Study as related to personality trait groupings and to other characteristics:

1. Stature/ $\sqrt[3]{\text{weight}}$ index when above 13.4.
2. Biacromial diam. \times 100/chest circ. index when above 47.
3. Chest breadth \times 100/biacromial diam. index when below 71.

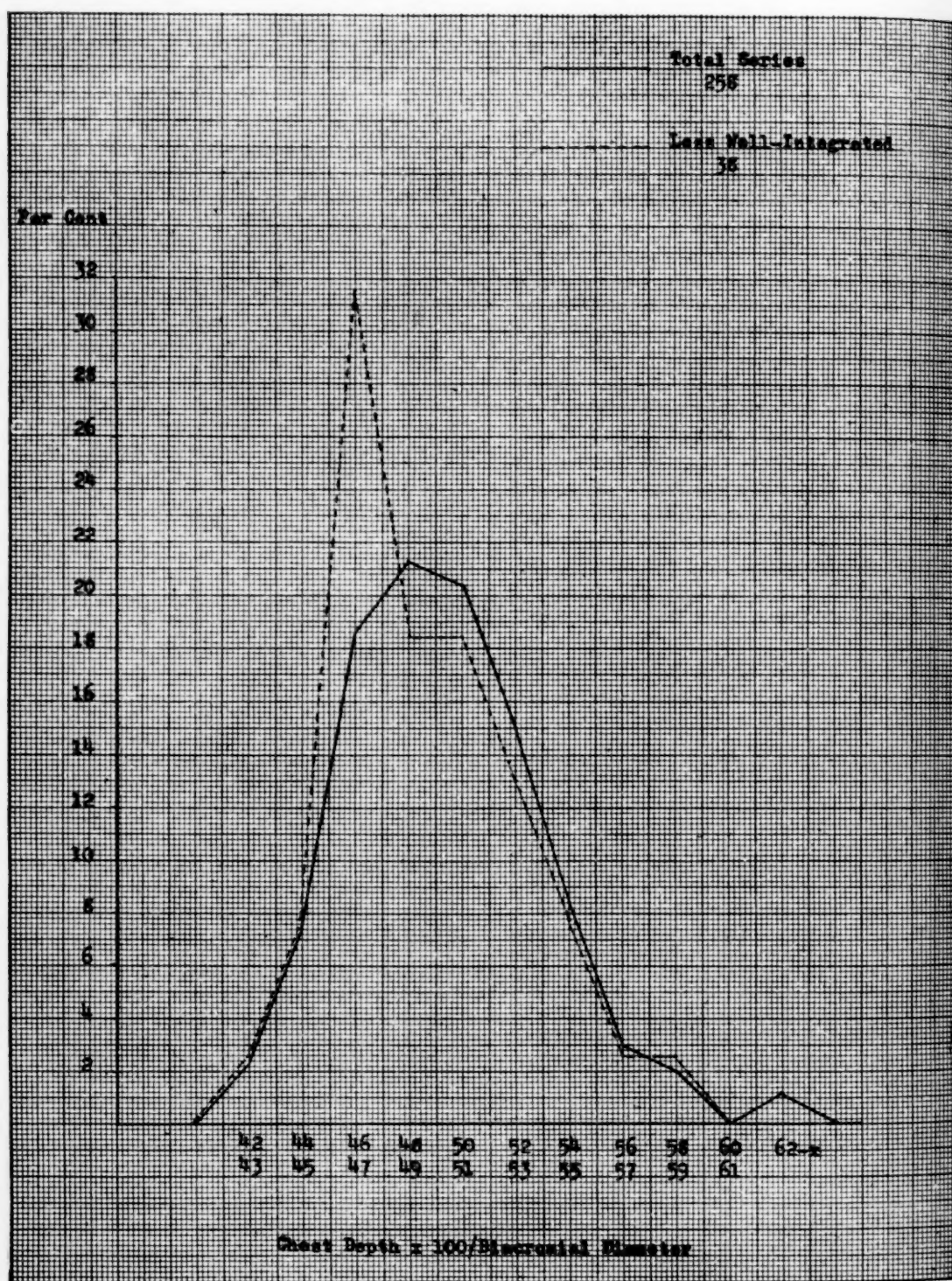


FIG. 1A. Frequency curves of "less well-integrated" and total series.

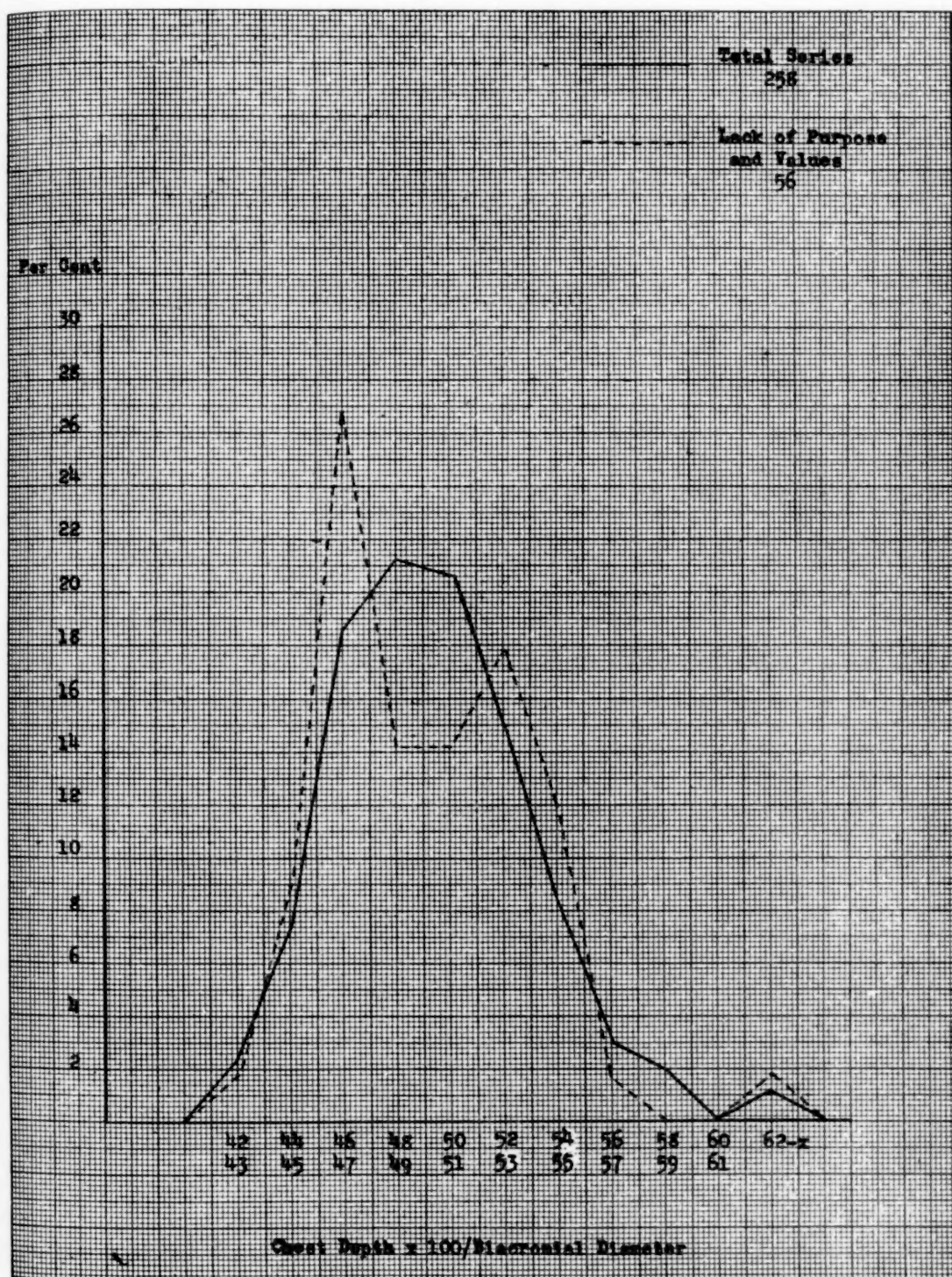


FIG. 1b. Frequency curves of "lack of purpose and values" and total series.

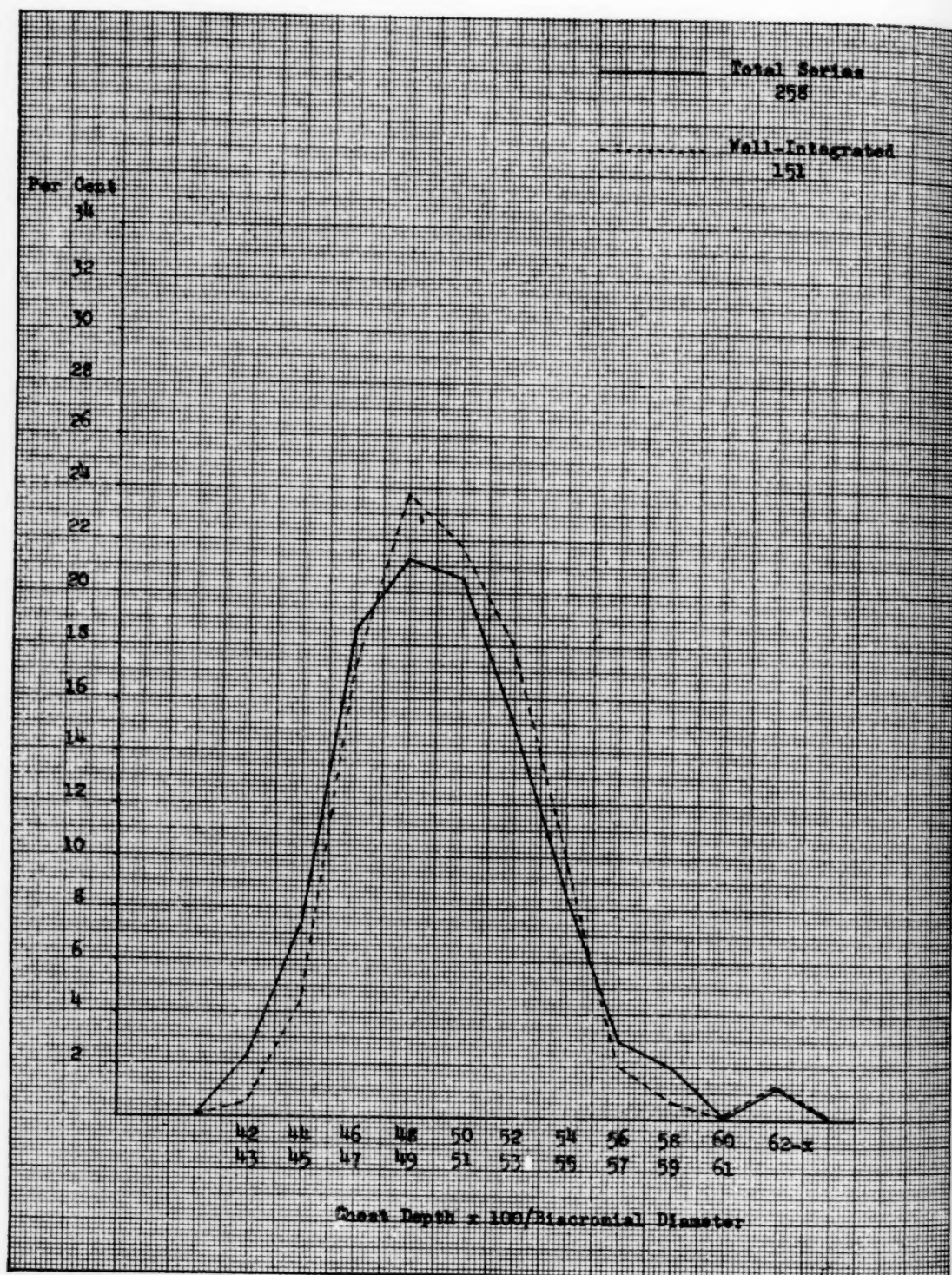


FIG. 2A. Frequency curves of "well-integrated" and total series.

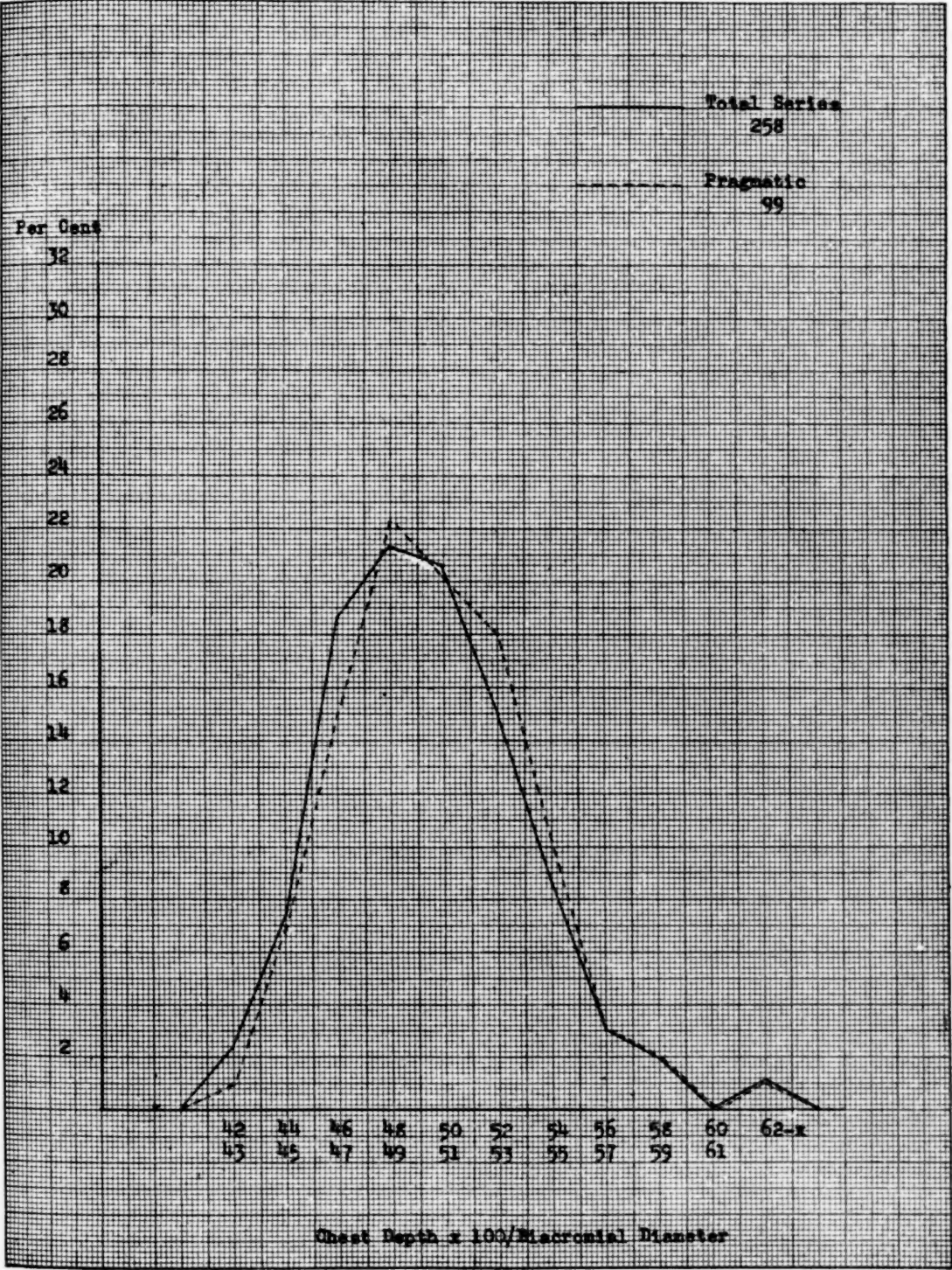


FIG. 2b. Frequency curves of "pragmatic" and total series.

4. Chest depth $\times 100$ /biacromial diam. index when below 48.
5. Hip breadth $\times 100$ /biacromial diam. index when above 74.
6. Head circ. $\times 100$ /chest circ. index when above 63.
7. Chest circ. $\times 100$ /stature index when below 49.
8. Calf circ. $\times 100$ /shoulder breadth when below 86.
9. Face breadth $\times 100$ /chest breadth when above 49.
10. Hand size (hand length \times hand breadth) $\times 100$ /weight when above 109.
11. Hip breadth $\times 100$ /chest breadth when above 102.

(All dimensions are in centimeters except face breadth, hand length and hand breadth which are in millimeters.)

These disproportions and their ranges, it should be pointed out, were empirically derived. There was no fixed mathematical method of formulating them. In fact, they are the considered result of the experience, intimate knowledge and intensive study of the material. Moreover, the list is merely a tentative one of significant body ratio ranges which seem to be related to personality traits and other characteristics of the individual. The range of the disproportions is also considered tentative in nature. As a result of further study, or eventual enlargement of the series, it might be that these ranges would be shifted somewhat one way or another. In short, the disproportions now listed should not be regarded in any way sacrosanct and final.

As a further word of caution, it must be emphasized that the term *disproportion* is not to be regarded as carrying with it the stigma of abnormality. These ratios are in no sense abnormal; they are simply normal deviates from the mean of the group as a whole.

The difference between "disproportions" and Sheldon's "dysplasias" is that Sheldon's term pertains to the somatotype components: endomorphy, mesomorphy and ectomorphy. "Disproportions," on the contrary, have to do with *certain restricted variations* in the relationship of gross measurements.

THE MATERIAL

The analysis is based upon data obtained on 258 individuals, Harvard undergraduates, who were first observed with few exceptions in their sophomore years. They represent a selected group in several respects.³ Very briefly, Grant Study subjects were selected on the basis of good medical health, satisfactory academic status, and overtly good social adjustment. On intellectual grounds only those young men were eliminated whose academic records were unsatisfactory in their fresh-

³ For detailed information relative to the nature of group, selection of subjects, methods of examination and definition of normal, see Heath, C. W. op. cit.

man year or whose prospects for completion of the total academic requirements were not promising.

For the purposes of this investigation special attention has been directed to the classification of the subjects according to the dominant personality trait groupings. A detailed account of the methods of interview, personality classification and definitions has already been published, but it should be pointed out that they were independently designated by the staff psychiatrists from the mass of interview material obtained from the subjects studied.⁴ The appearance of certain personality traits with considerable frequency made it desirable to group those subjects who had specific *outstanding* characteristics in common. Thus, for example, there appeared a sociable group, a vital affect group, a shy group, an unstable autonomic functions group, a self-conscious introspective group, etc. These various dominant trait groupings were assigned to an individual with no consideration of the other traits which might pertain to him.

The personality traits here described are heavily weighted towards the aspect of life attitudes, intellectual functions and motivations. This came about as a natural result of dealing with college students, selected "normal" individuals, and the particular orientation of the psychiatrists to the problems of "career choice" of the subjects.

DISPROPORTIONS AND DOMINANT PERSONALITY TRAIT GROUPINGS

In this section the various personality trait groupings are individually analyzed for frequency of disproportions. The percental occurrence of each disproportion in the trait groupings is plotted against the frequency in the series as a whole.

Autonomic Functions

The *unstable autonomic functions* group includes those young men "who show manifestations of instability in the functions which are generally conceded to be governed by the autonomic nervous system. Included are boys who show either periodic excessive anxiety or an undue amount of chronic anxiety as well as those subject to such symptoms as tremulousness, blushing, increased perspiration, palpitation and functional disturbances of the urinary and gastro-intestinal systems."

Compare the frequency of disproportions in the *unstable autonomic functions* group with that of the

⁴ Wells, F. L., and Woods, W. L.: *Outstanding Traits*. (in preparation); Heath, C. W. op. cit.

total series (Table I). It can be seen that in every instance the disproportions are more frequent among individuals of the *unstable autonomic functions* grouping than in the series as a whole. Thus, individuals with very wide shoulders relative to chest circumference are about two and one-half times as frequent in the *unstable autonomic functions* group as in the whole series. Individuals who are extremely linear are virtually twice as frequent in this trait grouping. In spite of the small size of the *unstable autonomic functions* groupings, statistically significant differences are present in the case of the height-weight, biacromial diameter-chest circumference, chest circumference-stature, and bi-iliac-chest breadth disproportions.

apparent from these figures that the *well-integrated* group differs only slightly from the total series in the percental frequency of disproportions. The direction of the differences is not consistent, being excessive in the case of some disproportions and deficient in others. In spite of the small differences, statistical significance is encountered in the height-weight disproportion (-3.7%), chest depth-biacromial disproportion (-5.8%), and in the calf circumference-biacromial disproportion (-6.1%). This would indicate that the *well-integrated* group is somewhat deficient in individuals with extreme linearity, with very flat chests relative to shoulder breadth, and with small calf circumferences relative to shoulder breadth.

TABLE I
DISPROPORTIONS IN THE UNSTABLE AUTONOMIC FUNCTIONS GROUP AND TOTAL SERIES

Disproportions	Total series (258)		Unstable autonomic functions group (36)		Diff.	Critical ratio*
	No.	%	No.	%		
Height/ $\sqrt[3]{}$ weight 13.5-x.....	36	14.2	10	27.8	+13.6	2.52
Biac. diam./chest circ. 48-x.....	22	8.7	8	22.2	+13.5	3.10
Chest br./biac. diam. x-70.....	89	35.2	17	47.2	+12.0	1.62
Chest depth/biac. diam. x-47.....	73	28.8	15	41.7	+12.9	1.84
Bi-iliac diam./biac. diam. 75-x.....	42	16.6	8	22.2	+ 5.6	0.97
Head circ./chest circ. 64-x.....	116	45.8	21	58.3	+12.5	1.62
Chest circ./stature x-48.....	54	21.3	13	36.1	+14.8	2.34
Calf circ./biac. diam. x-85†.....	62	24.5	12	33.3	+ 8.8	1.32
Face br./chest br. 50-x.....	77	30.4	15	41.7	+11.3	1.59
Hand size/weight 110-x.....	46	18.2	9	25.0	+ 6.8	1.14
Bi-iliac diam./chest br. 103-x.....	68	26.9	16	44.4	+17.5	2.55

* Critical ratio is in terms of standard errors and computed according to formula 19.6 of Yule, G. Udney and Kendall, M. G.: "An Introduction to the Theory of Statistics. Griffin and Co. 1937. Statistical significance in this report is based on a minimum critical ratio level of 2.0 standard errors.

† The number of individuals in the total series for this disproportion is 257.

Basic Personality

Under basic personality the psychiatrists have differentiated two trait groupings, *well-integrated* and *less well-integrated*. The *well-integrated basic personality* grouping is defined as "A group composed of young men who are steady, stable, dependable, thorough, sincere, and trustworthy. They have a steadiness and integrity of personality which is not dependent upon autonomic or even emotional stability. . . ." The *less well-integrated basic personality* group is composed of "young men who, in contrast to those of the well-integrated personality, tend towards the erratic, unreliable, sporadic, or undependable. Frequently their activities are ill-directed, little organized, and not carried through with the perseverance of those young men who possess a better-integrated basic personality. . . ."

Observe the percental frequency of the disproportions for these two basic groups and their differentiation from the total series (Table II). It is

In contrast to the *well-integrated* group, the *less well-integrated* group shows substantial differences from the total series frequencies. With one exception all disproportions are more frequent in the *less well-integrated* group than in the total series. The amount of differentiation is substantial in the case of the height-weight, chest breadth-biacromial, chest depth-biacromial, head circumference-chest circumference, chest circumference-stature, and calf circumference-biacromial disproportions. However, owing to the small size of the *less well-integrated* group, differences of statistical significance are encountered in only the height-weight and calf circumference-biacromial disproportions, and for all practical purposes for the chest depth-biacromial disproportion. In summary then, the *less well-integrated* group are distinguished by their significant excesses of individuals with extremely linear body builds, with flat chests relative to their shoulder breadths, and with small calf circumferences relative to their shoulder breadths.

Mood Dominance

At the mood level, the psychiatrists have characterized a group of individuals under the heading of *mood fluctuations*. By definition the *mood*

and those who show a continuous and prominent degree of some quality or phase of mood. . . ."

The important differences shown by the *mood fluctuations* grouping from the total series is evident

TABLE II
DISPROPORTIONS IN BASIC PERSONALITY TRAIT GROUPINGS

Disproportions	Total series (258)		Well-integrated (152)		Less well-integrated (38)	
	No.	%	No.	%	No.	%
Height/ $\sqrt[3]{\text{weight}}$ 13.5-x.	36	14.2	16	10.5	10	26.3
Biac. diam./chest circ. 48-x.	22	8.7	12	7.9	4	10.5
Chest br./biac. diam. x-70.	89	35.2	51	33.6	18	47.3
Chest depth/biac. diam. x-47.	73	28.8	35	23.0	16	42.1
Bi-iliac diam./biac. diam. 75-x.	42	16.6	27	17.8	4	10.5
Head circ./chest circ. 64-x.	116	45.8	74	48.7	21	55.3
Chest circ./stature x-48.	54	21.3	30	19.7	12	31.6
Calf circ./biac. diam. x-85.	62	24.5	28	18.4	16	42.1
Face br./chest br. 50-x.	77	30.4	48	31.6	13	34.2
Hand size/weight 110-x.	46	18.2	27	17.8	10	26.3
Bi-iliac diam./chest br. 103-x.	68	26.9	41	27.0	11	28.9

COMPARISON WITH TOTAL SERIES PERCENTAGES

	Total series vs. well-integrated		Total series vs. less well-integrated	
	Diff.	Critical ratio	Diff.	Critical ratio
Height/ $\sqrt[3]{\text{weight}}$ 13.5-x.	- 3.7	2.03	+12.1	2.31
Biac. diam./chest circ. 48-x.	- 0.8	0.54	+ 1.8	0.43
Chest br./biac. diam. x-70.	- 1.6	0.64	+12.1	1.69
Chest depth/biac. diam. x-47.	- 5.8	2.46	+13.3	1.96
Bi-iliac diam./biac. diam. 75-x.	+ 1.2	0.62	- 6.1	1.09
Head circ./chest circ. 64-x.	+ 2.9	1.12	+ 9.5	1.27
Chest circ./stature x-48.	- 1.6	0.75	+10.3	1.68
Calf circ./biac. diam. x-85.	- 6.1	2.74	+17.6	2.73
Face br./chest br. 50-x.	+ 1.2	0.50	+ 3.8	0.55
Hand size/weight 110-x.	- 0.4	0.20	+ 8.1	1.40
Bi-iliac diam./chest br. 103-x.	+ 0.1	0.04	+ 2.0	0.30

TABLE III
DISPROPORTIONS IN THE MOOD FLUCTUATIONS GROUP AND TOTAL SERIES

Disproportions	Total series (258)		Mood fluctuations (39)		Diff.	Critical ratio
	No.	%	No.	%		
Height/ $\sqrt[3]{\text{weight}}$ 13.5-x.	36	14.2	6	15.4	+ 1.2	0.23
Biac. diam./chest circ. 48-x.	22	8.7	4	10.2	+ 1.5	0.36
Chest br./biac. diam. x-70.	89	35.2	20	51.3	+16.1	2.28
Chest depth/biac. diam. x-47.	73	28.8	11	28.2	- 0.6	0.09
Bi-iliac diam./biac. diam. 75-x.	42	16.6	5	12.8	- 3.8	0.69
Head circ./chest circ. 64-x.	116	45.8	19	48.7	+ 2.9	0.39
Chest circ./stature x-48.	54	21.3	8	20.5	- 0.8	0.13
Calf circ./biac. diam. x-85.	62	24.5	14	35.8	+11.3	1.78
Face br./chest br. 50-x.	77	30.4	16	41.0	+10.6	1.56
Hand size/weight 110-x.	46	18.2	12	30.8	+12.6	2.21
Bi-iliac diam./chest br. 103-x.	68	26.9	11	28.2	+ 1.3	0.20

fluctuations group contains "young men characterized either by strongly marked mood or distinct changes in mood sufficiently striking to be an outstanding feature of their personality. There are thus two subgroups: those given to mood swings,

in the following disproportions: chest breadth-biacromial, calf circumference-biacromial, face breadth-chest breadth, and hand size-body weight (Table III). In each instance the percentage of these disproportions is in excess in the *mood*

fluctuations group. It is possible to say that the *mood fluctuations* group compared with the total series contains a significantly greater proportion of individuals with narrow chests relative to their shoulder breadths, a significantly greater proportion of large hands relative to their body weights, and a probably significant excess of individuals with small leg circumferences relative to their shoulder breadths.

of the usual values and adjustment to the realities of life." The *bland affect* group are "young men who show neither warm, positive mood nor richness and vitality of affect. They tend to be colorless and neutral in their affective responses. . . . In general, they form a group of plain, undistinguished, and uncomplicated individuals. . . . This very absence of positive and stimulating qualities is fundamental. . . ."

TABLE IV
DISPROPORTIONS IN THE AFFECT GROUPINGS

Disproportions	Total series (258)		Vital affect (51)		Sensitive affect (44)		Bland affect (45)	
	No.	%	No.	%	No.	%	No.	%
Height/ $\sqrt{\text{weight}}$ 13.5-x.	36	14.2	4	7.8	9	20.4	9	20.0
Biac. diam./chest circ. 48-x.	22	8.7	0	0	5	11.4	7	15.6
Chest br./biac. diam. x-70.	89	35.2	17	33.3	21	47.7	19	42.2
Chest depth/biac. diam. x-47.	73	28.8	6	11.8	14	31.8	15	33.3
Bi-iliac diam./biac. diam. 75-x.	42	16.6	8	15.7	7	15.9	10	22.2
Head circ./chest circ. 64-x.	116	45.8	16	31.4	24	54.5	24	53.3
Chest circ./stature x-48.	54	21.3	6	11.8	11	25.0	12	26.7
Calf circ./biac. diam. x-85.	62	24.5	11	21.6	13	29.5	7	15.6
Face br./chest br. 50-x.	77	30.4	11	21.6	15	34.1	19	42.2
Hand size/weight 110-x.	46	18.2	10	19.6	10	22.7	7	15.6
Bi-iliac diam./chest br. 103-x.	68	26.9	10	19.6	15	34.1	19	42.2

	Vital vs. total series		Sensitive vs. total series		Bland vs. total series	
	Diff.	C. R.	Diff.	C. R.	Diff.	C. R.
Height/ $\sqrt{\text{weight}}$ 13.5-x.	- 6.4	1.46	+ 6.2	1.29	+ 5.8	1.26
Biac. diam./chest circ. 48-x.	- 8.7	2.46	+ 2.7	0.70	+ 6.9	1.81
Chest br./biac. diam. x-70.	- 1.9	0.33	+12.5	1.91	+ 7.0	1.08
Chest depth/biac. diam. x-47.	-17.0	2.99	+ 3.0	0.48	+ 4.5	0.73
Bi-iliac diam./biac. diam. 75-x.	- 0.9	0.19	- 0.7	0.14	+ 5.6	1.11
Head circ./chest circ. 64-x.	-14.4	2.30	+ 8.7	1.27	+ 7.5	1.11
Chest circ./stature x-48.	- 9.5	1.85	+ 3.7	0.66	+ 5.4	0.97
Calf circ./biac. diam. x-85.	- 2.9	0.54	+ 5.0	0.85	- 8.9	1.53
Face br./chest br. 50-x.	- 8.8	1.52	+ 3.7	0.59	+11.8	1.89
Hand size/weight 110-x.	+ 1.4	0.29	+ 4.5	0.85	- 2.6	0.50
Bi-iliac diam./chest br. 103-x.	- 7.3	1.31	+ 7.2	1.18	+15.3	2.55

Affect

Another category of traits is labelled "affect." It refers to the basic "expressions of feeling, emotion, and desire" of the individuals. The subcategories are *vital*, *sensitive* and *bland*. The *vital affect* grouping consists of "young men characterized by vitality and richness of affect. They show a spontaneous force and energy which springs from strong affect rather than from an energy which depends upon voluntary effort of the higher ego functions. Such boys show richer verbal expression, greater animation in facial expression, and a more arresting tone of voice. . . ." The *sensitive affect* grouping includes young men "who create the impression of being sensitive, subtle in their thinking, inclined to aestheticism which makes difficult their acceptance

In comparison to the total series, the *vital affect* group is deficient in all but one disproportion, the hand size-weight disproportion where the excess is negligible (Table IV). The largest differences occur in connection with the chest depth-biacromial, head circumference-chest circumference, chest circumference-stature, face breadth-chest breadth, and biacromial-chest circumference disproportions. Of these, statistical significance is attained by the chest depth-biacromial, head circumference-chest circumference and biacromial-chest circumference disproportions, and approached by the chest circumference-stature ratio. In other words, the individuals with vital affect have less frequently the combinations of chests very shallow for shoulder breadth, heads large for chest size, shoulders large for chest size, and chests small for stature.

In contrast to the *vital affect* group, we find that the *sensitive affect* shows excesses of disproportions over the total series in every instance except for the bi-iliac-biacromial ratio. The chest breadth-biacromial disproportion shows an excess of 12.5% of individuals in the *sensitive affect* group, a figure which approaches statistical significance (C. R. 1.91). All the other excesses, however, are small.

The *bland affect* group is characterized by excesses in all disproportions with the exception of the calf circumference-biacromial diameter and hand size-weight ratios. The deficiency in small calf circumference relative to shoulder breadth is particularly significant in view of the consistent picture it presents relative to the frequency of the other disproportions. Further study of proportions in this group shows that the lower

chest circumference-stature ratios, and in a deficiency of the chest breadth-biacromial disproportion. The level of statistical significance is reached only in the case of the bi-iliac-biacromial index. It may be said that the *just-so* group is distinguished from the total series in its excesses of individuals with broad hips relative to shoulder breadth, large head circumferences relative to chest circumference, small chest circumferences relative to stature, and in the deficiency of narrow chests relative to the breadth of the shoulders.

Voluntary Functions

Under this classification the psychiatrists have distinguished three trait groupings, *inhibited*, *self-conscious and introspective*, and *self-driving*. The

TABLE V
DISPROPORTIONS IN THE JUST-SO BEHAVIOR GROUP AND TOTAL SERIES

Disproportions	Total series (258)		Just-so (35)		Diff.	Critical ratio
	No.	%	No.	%		
Height/ $\sqrt{\text{weight}}$ 13.5-x.....	36	14.2	6	17.1	+ 2.9	0.53
Biac. diam./chest circ. 48-x.....	22	8.7	5	14.3	+ 5.6	1.26
Chest br./biac. diam. x-70.....	89	35.2	9	25.7	- 9.5	1.27
Chest depth/biac. diam. x-47.....	73	28.8	9	25.7	- 3.1	0.44
Bi-iliac diam./biac. diam. 75-x.....	42	16.6	11	31.4	+14.8	2.52
Head circ./chest circ. 64-x.....	116	45.8	20	57.1	+11.3	1.44
Chest circ./stature x-48.....	54	21.3	11	31.4	+10.1	1.57
Calf circ./biac. x-85.....	62	24.5	10	28.6	+ 4.1	0.61
Face br./chest br. 50-x.....	77	30.4	10	28.6	- 1.8	0.25
Hand size/weight 110-x.....	46	18.2	8	22.8	+ 4.6	0.76
Bi-iliac diam./chest br. 103-x.....	68	26.9	11	31.4	+ 4.5	0.64

part of the body of those individuals with dominant *bland affect* is relatively heavier than the upper part of the torso. These individuals have larger leg circumferences relative to the breadth of the shoulders, broader hips relative to the width of the chest, and broader hips relative to the breadth of the shoulders.

Just-So Behavior

The *just-so* group includes those "men who are strongly systematic, neat, meticulous, and who depend on orderly routine and regularity. They are rigid and are apt to be upset if their established habits and way of living are interrupted. Some have conceived the trait as so deeply ingrained and beyond voluntary control that it should be grouped under Basic Personality."

The largest divergencies in frequency of disproportions of the *just-so* group from the series as a whole are apparent in the excesses of the bi-iliac-biacromial, head circumference-chest circumference,

inhibited group contains "young men who have a strong degree of conscientiousness and who frequently have doubts about doing things which they condone intellectually. They frequently describe a strong sense of responsibility, have difficulty in freeing themselves from their early moral attitudes. . . . A lack of spontaneity and freedom and a degree of stiffness in manner are characteristic. . . ." The *self-conscious and introspective* grouping consists of "individuals who are highly aware of their own thoughts and subjective feelings. They tend to pay more attention to what is going on within themselves than do more natural and outgoing boys. They also have a heightened sense of being observed by other people, even though they know this to be untrue. In consequence, they are self-conscious and cannot behave with directness and ease in social situations." The *self-driving* group are those "who show a high amount of self-control, will power and an ability to force themselves to do things. The energy and accomplish-

ments which result from strength in this aspect of higher ego function are distinguished from the spontaneous activity which springs from strong affect or mood. Many times they are aware of forcing themselves to work against inertia or resistance. . . ."

The *inhibited* group shows excesses of dispro-

portions over the total series. There is a 9.4 per cent deficiency of very shallow-chested individuals relative to the width of their shoulders, and a 9.8 per cent excess of men with large head circumferences relative to their chest circumferences. Neither of these divergencies, however, attains the level of statistical significance.

TABLE VI
DISPROPORTIONS IN THE VOLUNTARY FUNCTIONS GROUPINGS

Disproportions	Total series (258)		Inhibited (49)		Self-conscious introspective (64)		Self-driving (36)	
	No.	%	No.	%	No.	%	No.	%
Height/ $\sqrt[3]{\text{weight}}$ 13.5-x.	36	14.2	8	16.3	10	15.6	4	11.1
Biac. diam./chest circ. 48-x.	22	8.7	7	14.3	7	10.9	3	8.3
Chest br./biac. diam. x-70.	89	35.2	19	38.8	25	39.1	11	30.6
Chest depth/biac. diam. x-47.	73	28.8	16	32.6	22	34.4	7	19.4
Bi-iliac diam./biac. diam. 75-x.	42	16.6	12	24.5	9	14.1	7	19.4
Head circ./chest circ. 64-x.	116	45.8	28	57.1	38	59.4	20	55.6
Chest circ./stature x-48.	54	21.3	12	24.5	16	25.0	8	22.2
Calf circ./biac. diam. x-85.	62	24.5	9	18.4	20	31.2	6	16.7
Face br./chest br. 50-x.	77	30.4	19	38.8	21	32.8	11	30.6
Hand size/weight 110-x.	46	18.2	8	16.3	15	23.4	8	22.2
Bi-iliac diam./chest br. 103-x.	68	26.9	19	38.8	16	25.0	10	27.8
	Inhibited vs. total series		Self-conscious introspective vs. total series		Self-driving vs. total series			
	Diff.	C. R.	Diff.	C. R.	Diff.	C. R.		
Height/ $\sqrt[3]{\text{weight}}$ 13.5-x.	+ 2.1	0.47	+ 1.4	0.37	- 3.1	0.57		
Biac. diam./chest circ. 48-x.	+ 5.6	1.55	+ 2.2	0.72	- 0.4	0.09		
Chest br./biac. diam. x-70.	+ 3.6	0.59	+ 3.9	0.75	- 4.6	0.62		
Chest depth/biac. diam. x-47.	+ 3.8	0.65	+ 5.6	1.14	- 9.4	1.34		
Bi-iliac diam./biac. diam. 75-x.	+ 7.9	1.65	- 2.5	0.62	+ 2.8	0.49		
Head circ./chest circ. 64-x.	+11.3	1.76	+13.6	2.51	+ 9.8	1.27		
Chest circ./stature x-48.	+ 3.2	0.61	+ 3.7	0.83	+ 0.9	0.14		
Calf circ./biac. diam. x-85.	- 6.1	1.10	+ 6.7	1.44	- 7.8	1.17		
Face br./chest br. 50-x.	+ 8.4	1.42	+ 2.4	0.48	+ 0.2	0.03		
Hand size/weight 110-x.	- 1.9	0.38	+ 5.2	1.24	+ 4.0	0.67		
Bi-iliac diam./chest br. 103-x.	+11.9	2.08	- 1.9	0.40	+ 0.9	0.13		

portions over the total series frequencies in all but two instances, the calf-biacromial and hand size-weight ratios. The largest discrepancies occur in the bi-iliac-chest breadth and head circumference-chest circumference disproportions. The excess of very broad hips relative to chest width is statistically significant while that of large head size relative to chest size is possibly significant.

Like the inhibited group the *self-conscious and introspective* category presents excesses of disproportion in all but two instances. However, the only large divergency exists in the greater frequency in this latter trait group of individuals with large head circumference relative to chest circumferences. The difference is beyond the level of statistical significance.

The *self-driving* group shows no consistent trend with regard to the direction of its differences from

Cognitive Functions-Motivational

This classification encompasses those trait groupings which describe certain dominant motivational aspects of the subjects. They include motivations towards physical science, motivations towards practical organizing, the ideational, and the creative and intuitive.

The *physical science* grouping consists of those persons "who have exhibited a predominant interest in physical phenomena. They frequently describe early mechanical interests and aptitudes, preference for scientific subjects in secondary school, and a liking for manipulations of laboratory work. . . ." The *practical organizing* group "lack deep interest in any subject matter. They are not theoretical, speculative, or scholarly. Their interests are more practical, and in their course work they are better

in organization than in analytical or creative work. They describe an interest in managing or organizing and find their satisfaction in the sense of accomplishment, of 'getting things done.' They do not strive after 'higher values' and are essentially pragmatic in their outlook." The *ideational* grouping contains young men "who like to deal with ideas and tend to shy away from routine work

of these show considerable deviation. Statistical significance is attained for the height-weight, bi-acromial-chest circumference, and chest circumference stature ratios, in spite of the small size of the series. The individuals in the *physical science* grouping have an excess of their members with extreme linearity of body build, shoulders large for chest circumference, and chests small for stature.

TABLE VII
DISPROPORTIONS IN THE COGNITIVE FUNCTION-MOTIVATIONAL GROUPINGS

Disproportions	Total series (258)		Motivations towards physical science (31)		Practical organizing (95)		Ideational (54)		Creative and intuitive (16)	
	No.	%	No.	%	No.	%	No.	%	No.	%
Height/ $\sqrt[3]{\text{weight}}$ 13.5-x.....	36	14.2	9	29.0	5	5.3	10	18.5	4	25.0
Biac. diam./chest circ. 48-x...	22	8.7	7	22.6	7	7.4	5	9.2	1	6.2
Chest br./biac. diam. x-70....	89	35.2	13	41.9	31	32.6	19	35.2	6	37.5
Chest depth/biac. diam. x-47...	73	28.8	10	32.2	22	23.1	16	29.6	4	25.0
Bi-iliac diam./biac. diam. 75-x	42	16.6	7	22.6	12	12.6	12	22.2	3	18.8
Head circ./chest circ. 64-x....	116	45.8	17	54.8	35	36.8	35	64.8	6	37.5
Chest circ./stature x-48.....	54	21.3	12	38.7	14	14.7	14	25.9	3	18.8
Calf circ./biac. diam. x-85....	62	24.5	8	25.8	24	25.3	16	29.6	4	25.0
Face br./chest br. 50-x.....	77	30.4	13	41.9	25	26.3	17	31.5	4	25.0
Hand size/weight 110-x.....	46	18.2	8	25.8	15	15.7	9	16.7	3	18.8
Bi-iliac diam./chest br. 103-x...	68	26.9	12	38.7	24	25.2	14	25.9	5	31.2

	Motivations towards physical science vs. total series		Practical organizing vs. total series		Ideational vs. total series		Creative and intuitive vs. total series	
	Diff.	C. R.	Diff.	C. R.	Diff.	C. R.	Diff.	C. R.
Height/ $\sqrt[3]{\text{weight}}$ 13.5-x.....	+14.8	2.52	- 8.9	3.13	+ 4.3	1.04	+10.8	1.28
Biac. diam./chest circ. 48-x.....	+13.9	2.93	- 1.3	0.57	+ 0.5	0.15	- 2.5	0.37
Chest br./biac. diam. x-70.....	+ 6.7	0.83	- 2.6	0.67	0	0	+ 2.3	0.20
Chest depth/biac. diam. x-47....	+ 3.4	0.44	- 5.7	1.54	+ 0.8	0.15	- 3.8	0.35
Bi-iliac diam./biac. diam. 75-x...	+ 6.0	0.96	- 4.0	1.32	+ 5.6	1.27	+ 2.2	0.24
Head circ./chest circ. 64-x.....	+ 9.0	1.07	- 9.0	2.21	+19.0	3.15	- 8.3	0.68
Chest circ./stature x-48.....	+17.4	2.52	- 6.6	1.98	+ 4.6	0.93	- 2.5	0.25
Calf circ./biac. diam. x-85.....	+ 1.3	0.18	+ 0.8	0.23	+ 5.1	0.98	+ 0.5	0.05
Face br./chest br. 50-x.....	+11.5	1.48	- 4.1	1.09	+ 1.1	0.20	- 5.4	0.48
Hand size/weight 110-x.....	+ 7.6	1.17	- 2.5	0.79	- 1.5	0.32	+ 0.6	0.06
Bi-iliac diam./chest br. 103-x....	+11.8	1.57	- 1.7	0.47	- 1.0	0.19	+ 4.3	0.40

and problems of practical life. They tend to be theoretical or analytical. . . ." The *creative and intuitive* group is "characterized by high ability for self-expression or who are original and creative in their thought. Included are those who are strongly intuitive and spurn logical, objective, and analytical forms of thought. This group is largely composed of those contemplating artistic or literary careers."

Table VII compares the frequency of disproportions in these cognitive function-motivational groupings with those of the total series. With regard to the *physical science* grouping it is important to note that every one of the disproportions are here in excess over the total series frequency. Several

The opposite condition prevails in the case of the *practical organizing* group. In this trait classification the deviations from the total series values are deficiencies in all but one insignificant instance. In the *practical organizing* group there is a statistically significant deficiency of individuals with extreme relation of height to weight, of large head circumferences relative to chest circumference, and of small chest circumference relative to stature.

The *ideational* group is distinguished by its very large excess of individuals with large head circumference relative to their chest circumference.

No reliable deductions can be drawn from the disproportion frequencies of the *creative and intuitive* grouping. This is in part due to the very

small number of individuals (16) in this trait classification. There is, however, a suggestion that this group contains an excess of individuals with extremely linear physiques.

Cognitive Functions-Life Attitudes

Included under this heading are the following trait groupings: pragmatic, humanistic, political, cultural, and lack of purpose and values. The *pragmatic* group "are essentially practical in outlook, and are not concerned with an ultimate purpose and value of life. They are apt to be conforming and conventional, and accept the mores of the times. They are interested in establishing a family and supporting it comfortably. The practical considerations of getting ahead in life outweigh intrinsic interest in work, cultural values, philosophical speculations, or special reform." The *humanistic* grouping contains those individuals "who have a dominant interest in people, and for whom a knowledge of people and a desire to do work which will bring them into contact with people is not only an outstanding feature of their personality, but also the strongest driving force in determining their choice of life work." The *political* category is "a group who show a strong interest in social problems, social movements, government, and foreign affairs. They are motivated by a desire to participate in work which will lead to improvement of social conditions. They are distinguished from the *humanistic* group inasmuch as they are primarily interested in the broader and more abstract problems of social reform rather than in individual and personal relationships." The *cultural* category is "a group for whom participation in literature or the arts is predominant. This interest may be so highly developed that it leads them either to follow an artistic career or to consider any form of life work as a means of existence in order that they may satisfy their cultural needs." The *lack of purpose and values* grouping consists of those "young men who lack direction or purpose in life, in whom normal incentives and drives are feebly developed. A certain number complain that they have not found any values which make striving in the world worthwhile. Many of them are drifting and unenthusiastic, and give the impression of being descendants of a family in whom the original vitality is wearing out. A few describe a sincere search for values or higher life purpose which will create the motivating force to make life real and meaningful."

The figures giving the frequency deviations from the total series values of the disproportions for the above dominant trait groups are contained in Table

VIII. The *political* grouping exhibits no consistent configuration of differences from the total series values. None of the differences attain the level of statistical significance.

The *humanistic* group shows deficiencies in frequency of disproportions from the total series values in all but the height-weight and chest breadth-biacromial ratios. For all practical purposes the level of statistical significance is reached in the case of the calf circumference-biacromial disproportions, which signifies a deficiency of individuals with small leg circumferences relative to the breadth of the shoulders.

Similarly, the *pragmatic* group exhibits deficiencies from the total series values in all but the bi-iliac-biacromial ratio. This trait grouping possesses a statistically significant deficiency of individuals with large head circumferences relative to their chest circumferences, and a probably significant deficiency of individuals with very broad faces relative to their chest breadths, with small chest circumferences relative to their statures, and with extreme linearity as represented by the heights $\sqrt[3]{\text{weight}}$ ratio.

In contrast to the *humanistic* and *pragmatic* groups, the *cultural* and *lack of purpose and values* groupings show overall larger frequencies of these disproportions than the series as a whole. In the case of the *cultural* group, significant excesses of disproportions occur for the height-weight ratio, the head circumference-chest circumference ratio, and the calf circumference-biacromial diameter ratio. The *lack of purpose and values* group, on the other hand, have significant excesses of disproportions in the relationship of chest breadth to biacromial diameter, and in the relationship of bi-iliac diameter to chest breadth. These individuals, then, have an excessive frequency of chests which are narrow for shoulder breadth and hips wide for chest breadth.

Expressionistic Traits

In this category the psychiatrists have defined two groupings of individuals, the *inarticulate* and the *verbalistic*. The *inarticulate* consists of a group of young men who are characterized by "an inability to express themselves in language. Their descriptions are apt to be meagre and matter-of-fact, particularly concerning their own personal feelings and experiences. The poverty of verbal content seems not to be due to inhibition or unwillingness, but rather to a certain lack of richness in inner experience and in associated thought." The *verbalistic* group are the converse, containing those "who have

a facility with language or an ability to verbalize their thoughts in rich or well-formulated language."

In the matter of disproportions the *inarticulate* grouping shows substantial and significant excesses of individuals with the following disproportionate ratios: biacromial diameter-chest circumference, bi-iliac-biacromial, and bi-iliac-chest breadth. Other large excesses which, however, do not attain the

Social activities may be their outstanding interest. They make friends easily, like to meet new people, and have an ease in their social relationships which is unhampered by shyness or awkwardness." The *shy* grouping contains those young men who "experience a high degree of tension in social situations, and are embarrassed, reserved, and awkward in manner. There is a fundamental liking for

TABLE VIII
DISPROPORTIONS IN THE COGNITIVE FUNCTIONS-LIFE ATTITUDES GROUPINGS

Disproportions	Total series (258)		Political (44)		Humanistic (40)		Pragmatic (99)		Cultural (54)		Lack of purpose (56)	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Height/ $\sqrt[3]{\text{weight}}$ 13.5-x.....	36	14.2	5	11.4	6	15.0	9	9.1	14	25.9	8	14.3
Biac. diam./chest circ. 48-x....	22	8.7	2	4.5	1	2.5	8	8.1	3	5.6	7	12.5
Chest br./biac. diam. x-70.....	89	35.2	19	43.2	15	37.5	29	29.3	23	42.6	29	51.8
Chest depth/biac. diam. x-47...	73	28.8	13	29.5	9	22.5	23	23.2	18	33.3	21	37.5
Bi-iliac diam./biac. diam. 75-x...	42	16.6	7	15.9	6	15.0	19	19.2	10	18.5	11	19.6
Head circ./chest circ. 64-x.....	116	45.8	24	54.5	15	37.5	32	32.3	32	59.2	29	51.8
Chest circ./stature x-48.....	54	21.3	8	18.2	8	20.0	15	15.2	14	25.9	16	28.6
Calf circ./biac. diam. x-85.....	62	24.5	11	25.0	5	12.5	24	24.2	19	35.2	16	28.6
Face br./chest br. 50-x.....	77	30.4	15	34.1	12	30.0	23	23.2	17	31.5	20	35.7
Hand size/weight 110-x.....	46	18.2	8	18.2	7	17.5	14	14.1	14	25.9	11	19.6
Bi-iliac diam./chest br. 103-x...	68	26.9	10	22.7	8	20.0	29	29.3	16	29.6	22	39.3

	Political vs. Total series		Humanistic vs. total series		Pragmatic vs. total series		Cultural vs. total series		Lack of purpose vs. total series	
	Diff.	C. R.	Diff.	C. R.	Diff.	C. R.	Diff.	C. R.	Diff.	C. R.
Height/ $\sqrt[3]{\text{weight}}$ 13.5-x.....	-2.8	0.58	+0.8	0.16	-5.1	1.85	+11.7	2.77	+0.1	0.02
Biac. diam./chest circ. 48-x...	-4.2	1.09	-6.2	1.51	-0.6	0.27	-3.1	0.91	+3.8	1.14
Chest br./biac. diam. x-70...	+8.0	1.22	+2.3	0.33	-5.9	1.56	+7.4	1.28	+16.6	2.94
Chest depth/biac. diam. x-47...	+0.7	0.11	-6.3	0.96	-5.6	1.56	+4.5	0.82	+8.7	1.62
Bi-iliac diam./biac. diam. 75-x	-0.7	0.14	-1.6	0.30	+2.6	0.88	+1.9	0.42	+3.0	0.68
Head circ./chest circ. 64-x...	+8.7	1.27	-8.3	1.15	-13.5	3.42	+13.4	2.22	+6.0	1.02
Chest circ./stature x-48.....	-3.1	0.55	-1.3	0.22	-6.1	1.89	+4.6	0.93	+7.3	1.51
Calf circ./biac. diam. x-85....	+0.5	0.08	-12.0	1.92	-0.3	0.09	+10.7	2.05	+4.1	0.81
Face br./chest br. 50-x.....	+3.7	0.59	-0.4	0.06	-7.2	1.98	+1.1	0.20	+5.3	0.97
Hand size/weight 110-x.....	0	0	-0.7	0.12	-4.1	1.34	+7.7	1.65	+1.4	0.31
Bi-iliac diam./chest br. 103-x.	-4.2	0.69	-6.9	1.07	+2.4	0.68	+2.7	0.50	+12.4	2.36

level of statistical significance are found in the head circumference-chest circumference, and chest circumference-stature ratios.

The important differentiations from the total series values in the frequency of the disproportions for the *verbalistic* grouping are to be seen in the case of the chest breadth-biacromial diameter and chest depth-biacromial diameter ratios. Both of these are excesses and are above the level of statistical significance.

Social Functions

Social traits have been categorized by the psychiatrists into the triad of *sociable*, *shy* and *asocial* groupings. The *sociable* are "a group who are naturally friendly and who like to do things with people.

people and a regret that shyness leads them to avoid social events which they would enjoy if they could feel natural. A sense of social insecurity and a lack of confidence are frequently described, which are most marked in social situations." The *asocial* are a "group for whom social life, intimate friendships, and an interest in people are relatively unimportant. Such young men are satisfied with their own company and in the extreme are considered the 'lone wolves.' Their interest in 'things' is of more importance to them than their personal relationships. . . . Unlike the *shy* group, they have no unexpressed liking for people or yearning for social life."

The percental frequencies of these social traits and the extent of their differentiation from the total series values are given in Table X. It is in-

TABLE IX
DISPROPORTIONS IN EXPRESSIONISTIC GROUPINGS

Disproportions	Total series (258)		Inarticulate (36)		Verbalistic (46)	
	No.	%	No.	%	No.	%
Height/ $\sqrt[3]{\text{weight}}$ 13.5-x.....	36	14.2	7	19.4	8	17.4
Biac. diam./chest circ. 48-x.....	22	8.7	8	22.2	3	6.5
Chest br./biac. diam. x-70.....	89	35.2	15	41.7	23	50.0
Chest depth/biac. diam. x-47.....	73	28.8	13	36.1	19	41.3
Bi-iliac diam./biac. diam. 75-x.....	42	16.6	11	30.6	6	13.0
Head circ./chest circ. 64-x.....	116	45.8	21	58.3	24	52.2
Chest circ./stature x-48.....	54	21.3	12	33.3	10	21.7
Calf circ./biac. diam. x-85.....	62	24.5	6	16.7	14	30.4
Face br./chest br. 50-x.....	77	30.4	14	38.9	17	37.0
Hand size/weight 110-x.....	46	18.2	7	19.4	10	21.7
Bi-iliac diam./chest br. 103-x.....	68	26.9	18	50.0	16	34.8

Disproportions	Inarticulate vs. total series		Verbalistic vs. total series	
	Diff.	C. R.	Diff.	C. R.
Height/ $\sqrt[3]{\text{weight}}$ 13.5-x.....	+ 5.2	0.96	+ 3.2	0.69
Biac. diam./chest circ. 48-x.....	+13.5	3.10	- 2.2	0.58
Chest br./biac. diam. x-70.....	+ 6.5	0.88	+14.8	2.32
Chest depth/biac. diam. x-47.....	+ 7.3	1.04	+12.5	2.07
Bi-iliac diam./biac. diam. 75-x.....	+14.0	2.43	- 3.6	0.72
Head circ./chest circ. 64-x.....	+12.5	1.62	+ 6.4	0.96
Chest circ./stature x-48.....	+12.0	1.89	+ 0.4	0.07
Calf circ./biac. diam. x-85.....	- 7.8	1.17	+ 5.9	1.03
Face br./chest br. 50-x.....	+ 8.5	1.20	+ 6.6	1.07
Hand size/weight 110-x.....	+ 1.2	0.20	+ 3.5	0.68
Bi-iliac diam./chest br. 103-x.....	+23.1	3.36	+ 7.9	1.33

TABLE X
DISPROPORTIONS IN THE SOCIAL TRAITS

Disproportions	Total series (258)		Sociable (55)		Shy (46)		Asocial (24)	
	No.	%	No.	%	No.	%	No.	%
Height/ $\sqrt[3]{\text{weight}}$ 13.5-x.....	36	14.2	7	12.7	7	15.2	5	20.8
Biac. diam./chest circ. 48-x.....	22	8.7	2	3.6	7	15.2	6	25.0
Chest br./biac. diam. x-70.....	89	35.2	21	38.2	18	39.1	13	54.2
Chest depth/biac. diam. x-47.....	73	28.8	13	23.6	13	28.2	8	33.3
Bi-iliac diam./biac. diam. 75-x.....	42	16.6	9	16.4	7	15.2	6	25.0
Head circ./chest circ. 64-x.....	116	45.8	24	43.6	23	50.0	14	58.3
Chest circ./stature x-48.....	54	21.3	10	18.2	12	26.1	7	29.2
Calf circ./biac. diam. x-85.....	62	24.5	16	29.1	11	23.9	5	20.8
Face br./chest br. 50-x.....	77	30.4	12	21.8	16	34.8	12	50.0
Hand size/weight 110-x.....	46	18.2	14	25.4	8	17.4	7	29.2
Bi-iliac diam./chest br. 103-x.....	68	26.9	14	25.4	15	32.6	13	54.2

Disproportions	Sociable vs. total series		Shy vs. total series		Asocial vs. total series	
	Diff.	C. R.	Diff.	C. R.	Diff.	C. R.
Height/ $\sqrt[3]{\text{weight}}$ 13.5-x.....	- 1.5	0.36	+ 1.0	0.21	+ 6.6	0.97
Biac. diam./chest circ. 48-x.....	- 5.1	1.51	+ 6.5	1.72	+16.3	2.97
Chest br./biac. diam. x-70.....	+ 3.0	0.52	+ 3.9	0.61	+19.0	2.05
Chest depth/biac. diam. x-47.....	- 5.2	0.96	- 0.6	0.10	+ 4.5	0.51
Bi-iliac diam./biac. diam. 75-x.....	- 0.2	0.04	- 1.4	0.28	+ 8.4	1.16
Head circ./chest circ. 64-x.....	- 2.2	0.37	+ 4.2	0.63	+12.5	1.29
Chest circ./stature x-48.....	- 3.1	0.63	+ 4.8	0.88	+ 7.9	0.99
Calf circ./biac. diam. x-85.....	+ 4.6	0.89	- 0.6	0.10	- 3.7	0.44
Face br./chest br. 50-x.....	- 8.6	1.56	+ 4.4	0.72	+19.6	2.19
Hand size/weight 110-x.....	+ 7.2	1.56	- 0.8	0.16	+11.0	1.47
Bi-iliac diam./chest br. 103-x.....	- 1.5	0.28	+ 5.7	0.96	+27.3	3.17

teresting to note that in nine out of the eleven disproportions, the percental frequencies of the *shy* grouping falls between that of the *sociable* and the *asocial* groups. This follows the status of the *shy* group with respect to the other social traits. The *shy* group in a sense is intermediate between the *sociable* and *asocial*, possessing the desire for social contact but unable to express this feeling freely without shyness or awkwardness.

Considered individually with respect to their deviations from the total series, we find that the *sociable* group presents a series of small deviations, none statistically significant, but for the most part the frequencies of the disproportions are less than those of the total series. The *shy* group also shows small deviations (not statistically significant) but the majority of the disproportions are in excess of the total series frequencies. The *asocial* group, however, exhibits strong deviations from the total series, and in this instance all but one of the disproportions are in excess of the total series. Statistically significant deviations in this trait group occur for the biacromial diameter-chest circumference, chest breadth-biacromial diameter, face breadth-chest breadth, and bi-iliac-chest breadth disproportions. In other words, the *asocial* individuals tend to have a larger frequency of shoulders wide for chest size, chests narrow for shoulder breadth, faces broad for chest width, and hips broad for chest width.

Summary of Significant Divergencies in Disproportions for the Individual Personality Trait Groupings

The statistically significant divergencies over the total series frequencies of the disproportions for each of the trait groupings are summarized in Table XI. It is striking to note that without excep-

TABLE XI

SUMMARY OF SIGNIFICANT DIVERGENCIES IN DISPROPORTIONS OF TRAIT GROUPINGS FROM TOTAL SERIES

Unstable Autonomic Functions

Unstable Autonomic Functions Group

- Excess-height/ $\sqrt[3]{\text{weight}}$ 13.5-x
- Excess-biacromial diam./chest circ. 48-x
- Excess-chest circ./stature x-48
- Excess-bi-iliac/chest breadth 103-x
- Excess-chest depth/biacromial diam. x-47*

Basic Personality Trait Groupings

Well-Integrated Group

- Deficiency-height/ $\sqrt[3]{\text{weight}}$ 13.5-x
- Deficiency-chest depth/biacromial diam. x-47
- Deficiency-calf circ./biacromial diam. x-85

Less Well-Integrated Group

- Excess-height/ $\sqrt[3]{\text{weight}}$ 13.5-x
- Excess-calf circ./biacromial diam. x-85
- Excess-chest depth/biacromial diam. x-47*

Mood Fluctuations

Mood Fluctuations Group

- Excess-chest breadth/biacromial diam. x-70
- Excess-hand size/weight 110-x
- Excess-calf circ./biacromial diam. x-85*

Affect Groupings

Vital Affect Group

- Deficiency-biacromial diam./chest circ. 48-x
- Deficiency-chest depth/biacromial diam. x-47
- Deficiency-head circ./chest circ. 64-x
- Deficiency-chest circ./stature x-48*

Sensitive Affect Group

- Excess-chest breadth/biacromial diam. x-70*

Bland Affect Group

- Excess-bi-iliac/chest breadth 103-x
- Excess-face breadth/chest breadth 50-x*
- Excess-biacromial diam./chest circ. 48-x*

Just-So Behavior

Just-So Group

- Excess-bi-iliac/biacromial diam. 75-x

Voluntary Functions Groupings

Inhibited Group

- Excess-bi-iliac/chest breadth diam. 103-x
- Excess-head circ./chest circ. 64-x*

Self-Conscious and Introspective Group

- Excess-head circ./chest circ. 64-x

Self-Driving Group

Cognitive Functions-Motivational Groupings

Physical Science Group

- Excess-height/ $\sqrt[3]{\text{weight}}$ 13.5-x
- Excess-biacromial diam./chest circ. 48-x
- Excess-chest circ./stature x-48

Practical Organizing Group

- Deficiency-height/ $\sqrt[3]{\text{weight}}$ 13.5-x
- Deficiency-head circ./chest circ. 64-x
- Deficiency-chest circ./stature x-48*

Ideational Group

- Excess-head circ./chest circ. 64-x

Creative and Intuitive Group

Cognitive Functions-Life Attitudes Groupings

Political Group

Humanistic Group

- Deficiency-calf circ./biacromial diam. x-85*

Pragmatic Group

- Deficiency-head circ./chest circ. 64-x
- Deficiency-face breadth/chest breadth 50-x*
- Deficiency-height/ $\sqrt[3]{\text{weight}}$ 13.5-x*
- Deficiency-chest circ./stature x-48*

Cultural Group

- Excess-height/ $\sqrt[3]{\text{weight}}$ 13.5-x
- Excess-head circ./chest circ. 64-x
- Excess-calf circ./biacromial diam. x-85

Lack of Purpose and Values Group

- Excess-chest breadth/biacromial diam. x-70
- Excess-bi-iliac/chest breadth 103-x

Expressionistic Groupings

Inarticulate Group

- Excess-biacromial diam./chest circ. 48-x
- Excess-bi-iliac diam./biacromial diam. 75-x
- Excess-bi-iliac diam./chest breadth 103-x
- Excess-chest circ./stature x-48*

Verbalistic Group

- Excess-chest breadth/biacromial diam. x-70
- Excess-chest depth/biacromial diam. x-47

*Social Functions Groupings**Sociable Group**Shy Group**Asocial Group*

Excess-biac. diam./chest circ. 48-x

Excess-chest breadth/biacromial diam. x-70

Excess-face breadth/chest breadth 50-x

Excess-bi-iliac diam./chest breadth 103-x

* Probable significant differences-critical ratios of 1.73 to 2.00. See Peters, C. C. and VanVoorhis, W. R.: *Statistical Procedures and Their Mathematical Bases*. McGraw Hill, 1940, pp. 426-427. These authors suggest that 1.73 be taken "as a standard for provisional acceptance of the findings of an experiment . . . that ratio represents odds of 23 to 1."

tion the direction of the significant divergencies are the same for the particular trait category, all excesses or all deficiencies.

Significant *excesses* of one or more of the disproportions over the total series frequencies occur in the following trait groupings:

Unstable Autonomic Functions
Less Well-Integrated
Mood Fluctuations
Sensitive Affect
Bland Affect
Just-So
Inhibited
Self-Conscious and Introspective
Motivations Towards Physical Science
Motivations Towards the Ideational
Cultural
Lack of Purpose and Values
Inarticulate
Verbalistic
Asocial

Significant *deficiencies*, on the other hand, of one or more disproportions over the total series frequencies occur in these traits:

Well-Integrated
Vital Affect
Practical Organizing
Humanistic
Pragmatic

It is quite apparent that the two lists of personality groupings show marked contrast in the quality of the traits. The first listing (with excesses of disproportions), with few exceptions, contains trait groupings indicating lesser stability, less integration, sensitivity and complexity of the personality, and less capacity for making easy social adjustments. The second listing (with deficiencies of disproportions) is diametrically opposite to the first. Here the traits are suggestive of stability, good integration and ease of making adjustments.

Disproportions and A, B, C, Soundness Classification

In addition to describing the subjects by dominant personality traits, the psychiatrists of the Grant Study have separated the participants into three

classes, A, B, and C, according to an *overall* judgment of "soundness." The A group is the most sound class, the B less sound, and the C the least sound. The A soundness class contains "young men who were thoroughly 'sound' in Webster's meaning of 'free from flaws,' 'on a firm foundation.' It was hard for the physician to see any particular way in which they might have serious trouble in handling the problems which might confront them." The B soundness class is a group "in whom there was a question of a minor flaw. For instance, if a boy was lacking in warmth in his touch with people or if he was erratic, or showed degrees of sensitiveness leading to minor frustrations, he would be placed in this group." The C class consists of young men "whose history revealed a definite handicap. A good illustration would be swings of mood which interfered noticeably with function. Pronounced groping for purposes and values in life would be sufficient evidence to place a young man in this group."

From the frequencies of the disproportions in the A, B, and C classes (Table XII) it can be seen that the A class has a smaller percentage of disproportions in every instance than the B and C classes. The percentage of disproportions for the B class is intermediate between A and C in the case of six of the ratios, and somewhat greater than C in the five remaining disproportions.

Relative to the total series frequencies, the A class is deficient in all the disproportions, the B class shows excesses in every instance, while the C class has excesses in eight out of the eleven disproportions. Where there are deficiencies in the C class these are very small and statistically insignificant.

A detailed analysis reveals statistically significant deficiencies of individuals in the A class with very wide shoulders relative to their chest circumferences, with very narrow chests relative to the breadth of the shoulders, with very large head circumferences relative to the circumferences of the chest, with very broad hips relative to the width of the chest, and very shallow chests relative to the breadth of the shoulders. Deficiencies, of probable statistical significance, are also found in individuals with very broad faces relative to the width of the chest, with large hand size relative to the body weight, and with small chest circumferences relative to their statures.

The B class has statistically significant excesses of individuals with large head circumferences relative to their chest circumferences, with large hands relative to their body weights, and probably

with very narrow chests relative to the width of the shoulders.

The excesses of statistical significance for the C class indicate for this group a substantially greater proportion of individuals with very wide shoulders relative to the circumference of the chest, very flat chests relative to the width of the shoulders, large head circumferences relative to their chest circumferences, and with very broad hips relative to the width of their chests.

A random sample of 18-20 year old Freshmen of the class of 1946 has been chosen for comparison. This group of 300 young men, examined in July of 1942, is comparable in age to the Grant Study participants. Table XIII gives the frequency of disproportions among the freshmen as contrasted with the Grant series. It is readily apparent that there are striking differences between the two groups. The undifferentiated freshmen show consistently larger frequencies of disproportions than do the

TABLE XII
DISPROPORTIONS IN THE A, B, C, CLASSIFICATIONS

Disproportions	Total Series (258)		A (92)		B (112)		C (45)	
	No.	%	No.	%	No.	%	No.	%
Height/ $\sqrt[3]{\text{weight}}$ 13.5-x.....	36	14.2	10	10.9	17	15.2	9	20.0
Biac. diam./chest circ. 48-x.....	22	8.7	2	2.2	11	9.8	8	17.8
Chest br./biac. diam. x-70.....	89	35.2	25	27.2	46	41.1	18	40.0
Chest depth/biac. diam. x-47.....	73	28.8	19	20.6	33	29.5	19	42.2
Bi-iliac diam./biac. diam. 75-x....	42	16.6	14	15.2	22	19.6	6	13.3
Head circ./chest circ. 64-x.....	116	45.8	29	31.5	61	54.5	27	60.0
Chest circ./stature x-48.....	54	21.3	14	15.2	28	25.0	10	22.2
Calf circ./biac. diam. x-85.....	62	24.5	18	19.6	33	29.5	10	22.2
Face br./chest br. 50-x.....	77	30.4	21	22.8	39	34.8	17	37.7
Hand size/weight 110-x.....	46	18.2	11	12.0	28	25.0	8	17.8
Bi-iliac diam./chest br. 103-x.....	68	26.9	15	16.3	33	29.5	18	40.0

	A vs. total series (92)		B vs. total series (112)		C vs. total series (45)	
	Diff.	C. R.	Diff.	C. R.	Diff.	C. R.
Height/ $\sqrt[3]{\text{weight}}$ 13.5-x.....	- 3.3	1.13	+ 1.0	0.40	+ 5.8	1.23
Biac. diam./chest circ. 48-x.....	- 6.5	2.76	+ 1.1	0.55	+ 9.1	2.38
Chest br./biac. diam. x-70.....	- 8.0	2.01	+ 5.9	1.74	+ 4.8	0.74
Chest depth/biac. diam. x-47.....	- 8.2	2.17	+ 0.7	0.22	+13.4	2.18
Bi-iliac diam./biac. diam. 75-x....	- 1.4	0.45	+ 3.0	1.14	- 3.3	0.65
Head circ./chest circ. 64-x.....	-14.3	3.43	+ 8.7	2.46	+14.2	2.10
Chest. circ./stature x-48.....	- 6.1	1.78	+ 3.7	1.28	+ 0.9	0.16
Calf circ./biac. diam. x-85.....	- 4.9	1.36	+ 5.0	1.64	- 2.3	0.40
Face br./chest br. 50-x.....	- 7.6	1.98	+ 4.4	1.35	+ 7.3	1.17
Hand size/weight 110-x.....	- 6.2	1.92	+ 6.8	2.48	- 0.4	0.08
Bi-iliac diam./chest br. 103-x.....	-10.6	2.86	+ 2.6	0.82	+13.1	2.18

DISPROPORTIONS IN OTHER GROUPS

Comparison Between Grant Study Series and Harvard Freshmen

It is pertinent to inquire, "How do these selected Grant Study subjects compare with an undifferentiated sample of Harvard undergraduates?" Since the Grant group of "normal" young men was selected on the basis of satisfactory academic status, good health, and overtly good social adjustment, then it may be presumed that as a group they will deviate significantly from the general average of Harvard undergraduates. This should follow since the foregoing analysis indicates that frequency of disproportions is associated with those personality traits which make for less easy social adjustment.

"normal" Grant study subjects. The only exception to this trend is in the bi-iliac-biacromial index, where the freshmen have an insignificantly smaller percentage of individuals with this disproportion. In every other instance the disproportions are in excess in the freshmen, and in most cases the differences are statistically significant.

The freshmen compared to the Grant Study series have a significantly *greater* percentage of individuals with extreme linearity or ectomorphy, with very broad shoulders relative to their chest circumferences, with narrow chests relative to their shoulder breadths, with very large head circumferences relative to the size of the chest circumferences; a greater proportion of individuals with

small chest circumferences relative to their statures, with very broad faces relative to the width of their chests, with large hands relative to their body weights, and with broad hips relative to their chest widths.

Here then, is strong confirmation of the association of disproportions with personality. In no wise were the Grant Study subjects selected on the basis of anthropological measurements or observations, yet the group is significantly less disproportionate than a random sample of undergraduates of comparable age. The paucity of disproportions in the Grant series must be related to its "normality," since this was the basis of selection from the undergraduate body.

occur in the following disproportions: height-weight ratio, bi-iliac-biacromial ratio, head circumference-chest circumference ratio, chest circumference-stature ratio, face breadth-chest breadth ratio, and bi-iliac chest breadth ratio. In every one of these disproportions, the group with C and D ratings includes a significantly larger percentage of its individuals than does the group with A and B ratings.

It should be recognized that these predictive ratings of the freshmen made by the college physicians are not strictly comparable to the A, B, C "soundness" ratings of the Grant Study series. The latter were established by the staff psychiatrists after considerable contact, study and interview of

TABLE XIII
COMPARISON OF DISPROPORTIONS BETWEEN GRANT STUDY SERIES AND HARVARD FRESHMEN

Disproportions	Grant Study (258)		Harvard Freshmen (300)		Diff.	Critical ratio
	No.	%	No.	%		
Height/ $\sqrt{\text{weight}}$ 13.5-x.....	36	14.2	73	24.3	+10.1	3.06
Biac. diam./chest circ. 48-x.....	22	8.7	69	23.0	+14.3	4.78
Chest br./biac. diam. x-70.....	89	35.2	181	60.3	+25.1	6.12
Chest depth/biac. diam. x-47.....	73	28.8	107	35.7	+ 6.9	1.75
Bi-iliac diam./biac. diam. 75-x.....	42	16.6	48	16.0	- 0.6	0.19
Head circ./chest circ. 64-x.....	116	45.8	202	67.3	+21.5	5.23
Chest circ./stature x-48.....	54	21.3	134	44.7	+23.4	6.09
Calf circ./biac. x-85.....	62	24.5	80	26.7	+ 2.2	0.59
Face br./chest br. 50-x.....	77	30.4	154	51.3	+20.9	5.14
Hand area/weight 110-x.....	46	18.2	108	36.0	+17.8	4.85
Bi-iliac diam./chest br. 103-x.....	68	26.9	136	45.3	+18.4	4.62

Disproportions in Freshmen Series According to "Soundness" Ratings

Further evidence of the relationship between the disproportions and personality may be derived from "soundness" ratings of the Freshmen series. Subjective ratings for "soundness" were made for the freshmen by the examining college physicians at the end of the forty minute period of the entrance medical examination. These ratings, on an ABCD scale, were made on the basis of the judgment of the physician as to the general all around soundness and stability of the individual, as well as to his ability to adjust to the college environment.

For the purposes of this study, the "soundness" ratings of the freshmen were separated into two groups, those individuals with ratings of A or B and those with ratings of C or D. These two groups are compared for their frequency of disproportions in Table XIV. Again we find that the "more sound" persons (ratings of A and B) have in general fewer disproportions than the "less sound" individuals (ratings of C and D). Differences that attain the level of statistical significance

the subjects. The freshmen ratings, on the other hand, were impressionistic, intuitive ratings as a result of a single and unprotracted interview. What appears to be significant from the point of view of this study is the verification of the relationship between disproportions and "soundness" of personality. This is all the more important since the results are based on other data apart from that of the Grant Study series and on "soundness" ratings made by other examiners.

Comparison Between Grant Study and Psychiatric Clinic Series

The association of disproportions with personalities less well-organized and less capable of making easy social adjustments is further emphasized by an analysis of a series of 51 Harvard students referred to the Psychiatric Clinic of the Department of Hygiene of Harvard University. More than half of the group were diagnosed as belonging to the category of psychoneurosis of the anxiety type, while the remainder consisted of a conglomerate assembly of individuals classified as having psycho-

pathic conditions of various types, functional disorders, and a few undiagnosed. This group is of the same age as the Grant Study series.

The Psychiatric Clinic series has been compared with the Grant Study group for frequency of disproportions (Table XV). The data indicate clearly a greater incidence of the various disproportions in the Psychiatric Clinic group. In only one ratio

the Psychiatric Clinic series exceeds those of the Freshmen group.

DISCUSSION

The preceding analysis gives clear indication of significant relationships between physique and personality in normal individuals. The main generalization to be derived from these data is the principle

TABLE XIV
DISPROPORTIONS IN FRESHMAN '46 SERIES ACCORDING TO "SOUNDNESS" RATINGS

Disproportions	A and B "Soundness" ratings (176)		C and D "Soundness" ratings (110)		Diff.	Critical ratio
	No.	%	No.	%		
Height/ $\sqrt[3]{\text{weight}}$ 13.5-x.....	38	21.6	36	32.7	+11.1	2.04
Biac. diam./chest circ. 48-x.....	37	21.0	29	26.4	+ 5.4	1.04
Chest br./biac. diam. x-70.....	100	56.8	72	65.5	+ 8.7	1.48
Chest depth/biac. diam. x-47.....	65	36.9	40	36.4	- 0.5	0.09
Bi-iliac diam./biac. diam. 75-x.....	22	12.5	25	22.7	+10.2	2.16
Head circ./chest circ. 64-x.....	109	61.9	84	76.4	+14.5	2.66
Chest circ./stature x-48.....	71	40.3	60	54.5	+14.2	2.36
Calf circ./biac. diam. x-85.....	48	27.3	28	25.5	- 1.8	0.34
Face br./chest br. 50-x.....	87	49.4	72	65.5	+16.1	2.73
Hand area/weight 110-x.....	58	33.0	42	38.2	+ 5.2	0.89
Bi-iliac diam./chest br. 103-x.....	72	40.9	64	58.2	+17.3	2.89

TABLE XV
COMPARISON OF DISPROPORTIONS BETWEEN GRANT STUDY SERIES AND PSYCHIATRIC CLINIC SERIES

Disproportions	Grant Study (258)		Psychiatric Clinic (51)		Diff.	Critical ratio
	No.	%	No.	%		
Height/ $\sqrt[3]{\text{weight}}$ 13.5-x.....	36	14.2	12	23.5	+ 9.3	1.47
Biac. diam./chest circ. 48-x.....	22	8.7	14	27.4	+18.7	2.88
Chest br./biac. diam. x-70.....	89	35.2	32	62.7	+27.5	3.72
Chest depth/biac. diam. x-47.....	73	28.8	14	27.4	- 1.4	0.20
Bi-iliac diam./biac. diam. 75-x.....	42	16.6	12	23.5	+ 6.9	1.08
Head circ./chest circ. 64-x.....	116	45.8	41	80.4	+34.6	5.43
Chest circ./stature x-48.....	54	21.3	20	39.2	+17.9	2.45
Calf circ./biac. diam. x-85.....	62	24.5	21	41.2	+16.7	2.26
Face br./chest br. 50-x.....	77	30.4	33	64.7	+34.3	4.71
Hand area/weight 110-x.....	46	18.2	14	27.4	+ 9.2	1.37
Bi-iliac diam./chest br. 103-x.....	68	26.9	26	51.0	+24.1	3.20

are the disproportions fewer than in the "normal" Grant Study series, and then by a very small percentage. In a number of instances the frequency of disproportions is about twice as marked as in the Grant Study group. The differences between the Psychiatric Clinic and the Grant Study series which are beyond the level of statistical significance are indicated in the following ratios: biacromial-chest circumference, chest breadth-biacromial diameter, head circumference-chest circumference, chest circumference-stature, calf circumference-biacromial diameter, face breadth-chest breadth, and bi-iliac diameter-chest breadth.

It is of some interest to note that in certain of the bodily ratios the frequency of the disproportions of

that unilateral disharmonic bodily proportions are associated with less stable personalities, with traits indicating difficulty in making easy social adjustments, and with motivations that are less practicable and leading to more ideational (cerebrotonic) fields of endeavor. The unilateral aspect of these disproportions must be stressed. Their association with the less well-integrated personalities involves one end of the distribution curve of the bodily ratio. Thus the traits concerned are positively related to bodily proportions which represent, for example, head size big for the size of chest, and not head size small for size of chest. They are associated with shoulders big for the size of chest, and not with shoulders small for the size of chest; with

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hands large for the size of body, and not with hands small for the size of the body, et cetera. In the case of the extremes of the curves opposite to those defined as disproportions, there is no clear-cut association in every instance with the more stable, practical and more vital traits, such as the "well-integrated," "practical organizing," "self-driving," "humanistic," "sociable," and "vital affect." Such a relationship does exist in certain cases and in others there is simply a deficiency of the more sensitive and complex traits.

The question may be raised in connection with the ratios as to the specific nature of the disproportion. Is the index the result of a very large size of one dimension or the small size of the other dimension? For example, in the disproportion of head circumference-chest circumference of 64 and higher, is the index due to the large size of the head or the small size of the chest? In answer to this query, analyses of the disproportionate indices have been made, and the results show that in approximately 50 per cent of the cases the disproportionate index is attributable to the combination of the large size of one of the dimensions and the small size of the other measurement. In approximately 40 per cent of cases, although there is a disproportionate relationship between one dimension and the other, both of the absolute dimensions are smaller than the corresponding means of the series. In the remaining cases, approximately 10 per cent, both measurements are larger than their corresponding means, while at the same time one of the dimensions is still disproportionately larger than the other. Thus, in 51.3 per cent of head circumference-chest circumference disproportions the absolute head circumference is larger than the mean of the total series and the corresponding chest circumference smaller than the mean of the total series. In 41.9 per cent of instances both the head circumference and the chest circumference dimensions are smaller than the corresponding means of the entire series. And in the residual 6.8 per cent, the head and chest circumferences are larger than the means of the entire series.

The consistency of the general findings in other groups distinct from the Grant Study material makes it highly unlikely that the association of the disproportions with the personality trait groupings may be the result of some artifact or peculiarity of the Grant Study sample. The analysis of the Freshmen data and the Psychiatric Clinic series must be considered as strong evidence of the authenticity of this general psycho-physical relationship. The fact that the physical and personality

data have been independently gathered by different observers representing different disciplines removes from consideration the imputation of spurious correlation through bias, or "halo effect."

The findings in this study are perforce circumscribed by the nature and scope of the personality traits with which the disproportions were related. The trait groupings represent dominant or outstanding traits, which are to a great extent on the intellectual and motivational level. The extension of this concept of disproportions to traits of lesser degrees of intensity, and on the more biological and temperamental levels, will probably yield additional significant relationships.

The origin of the variations in the body proportions here studied is largely a matter of speculation. But since the disproportions are derived from measurements which are in most instances closely related to skeletal dimensions, it suggests that they are largely independent of physical environmental influences and that we are dealing with characteristics which are principally of an inherited nature. The variations in such measurements as the circumference of the head, the biacromial breadth of the shoulders, the bizygomatic width of the face, the breadth and depth of the chest, and the bi-iliac breadth of the hips, can hardly be ascribed to gross factors of the physical environment such as climate, diet and disease. In this "normal" group, the diets, from infancy on, may be regarded as being well-standardized, at least from the point of view of divergencies of diets throughout the world. Among these selected young men, there was rarely evidence of any stigmata which could be attributed to rickets or other deficiency diseases, or to any specific effective agencies of pathology. Other conditions which might conceivably have interfered with or modified skeletal growth were not found. There is no doubt that racial factors play some role, and it is thought that familial influences might be identified. In addition, there are scarcely any indications that the personality traits themselves might have been modified appreciably by the presence of these disproportions. In many cases, the disproportions are so subtle to the eye that they cannot be identified without the actual measurement and computation of the ratio. They are scarcely so pronounced as to interfere with normal activities or indulgence in sports although they may dictate to a certain extent the particular variety of sports in which the subject might excel. It would seem that the disproportions are constitutional, and as such their relationship to the personality traits may indicate a genetic element as a basic factor in the determination of behavior

and personality. The proof of this supposition must await further studies on other groups in varying cultural settings. If it is true, it becomes of course a matter of marked importance. On the other hand, the absence of any hereditary significance of the disproportions to behavior would in no way diminish the potential utility of these findings. There would still remain considerable usefulness in understanding the individual "as is" and possible use for prediction based on further work. The application of these findings in education, medicine, personnel selection, and the like is readily apparent.

It is noteworthy that the disproportions do not appear to be of equal importance in their relationship to the various personality traits. There are some disproportions which are more frequently associated with the traits and others less so. If we take as a yardstick the statistically significant excesses over the total series frequencies, we find that the bi-iliac-chest breadth and the chest breadth-biacromial disproportions are significantly differentiated in more of the personality trait groupings here studied than any of the other ratios. In contrast, the hand area-weight, bi-iliac-biacromial, and face breadth-chest breadth disproportions are significantly differentiated in the least number of the personality traits. In regard to significant deficiencies from the total series frequencies, the head circumference-chest circumference disproportion leads by far in number of significant differentiations, and is followed by the chest circumference-stature ratio. No deficiencies of statistical significance are encountered in the case of the hand area-weight, bi-iliac-biacromial, and bi-iliac-chest breadth disproportions. Hence, the bi-iliac-biacromial and hand area-weight disproportions are of least value in their overall relationship to these personality trait groupings.

The impression is not meant to be conveyed that the disproportions indicated in this study represent all the amodal proportions of significance as related to personality. The need for pressing further the search for additional ratios of this order is implicit and desirable. Added investigations may well disclose changes in the ranges of the disproportions which would produce more significant relationships. The use of more formalized methods for establishing the most profitable ranges for the disproportions, such as the X^2 method for determining the best "cut-off points," might increase their predictive value. Inasmuch as some of the body ratios used change somewhat with age, different ranges for the disproportions may be required for age groups other than that of the college level. It also should

be recognized that the trait groups were compared with the total series of which they are a part. If they were taken out of the total series so that the comparisons would be between one trait group and another, the differences obtained would naturally be larger than those quoted for the total series.

Another subject which necessitates further study is the relationship of the disproportions with the various somatotypes. Disproportions appear to be least common in the marked endomorphs and the marked mesomorphs. They are most common in the strong ectomorphs. This does not mean that disproportions are synonymous with ectomorphy or that the underlying factor in the disproportions is the ectomorphic element. Disproportions occur in individuals in which the ectomorphic component is not marked, and not all strong ectomorphs are replete with disproportions. The element of strong ectomorphy is included in one of the disproportions in the height $\sqrt[3]{\text{weight}}$ ratio of 13.5 and higher. Even though this height-weight ratio is correlated with almost all of the other ratios of disproportion, and particularly so with chest circumference-stature index, it does not show the greatest frequency of significant divergencies with the personality traits but actually less than several other disproportions. There are instances in which the chest circumference-stature disproportion presents significant personality trait divergencies which are not matched by the height-weight ratio. It would appear therefore that the height-weight disproportion (representing marked ectomorphy) is not independent of other disproportions but it cannot be said that it is so highly intercorrelated as to produce spurious correlations in the case of the other disproportions.

SUMMARY

Results of the analysis of the body proportions of a group of 258 "normal" young men, investigated by the Grant Study of Harvard University, indicate an association between restricted ranges of the body ratios called *disproportions*, and the frequency of certain dominant personality traits. The disproportions here studied are:

- Stature tall for body weight
- Shoulders broad for circumference of chest
- Chests narrow for width of shoulders
- Chests shallow (front to back) for width of shoulders
- Hips broad for width of shoulders
- Heads large for size of chest
- Chests small for stature

Leg circumferences small for width of shoulders
Faces broad for width of chest
Hands large for body weight
Hips broad for width of chest

Individuals possessing these disproportions have a greater frequency of those dominant personality traits indicating lesser stability, lesser integration, greater sensitivity and complexity of the personality, and lesser capacity for making easy social adjustments. Some of the traits which go with the disproportions are "unstable autonomic functions," "less well-integrated," "mood fluctuations," "bland affect," "inhibited," "cultural," "lack of purpose and values," "inarticulate," and "asocial."

Conversely, individuals with traits indicating "soundness," stability, integration, vitality, and strength of personality have fewer disproportions in their physiques than the average of the group.

These generalizations are supported by analyses

of a large series of unselected undergraduates rated on the basis of general "soundness" of personality, and a group of students who were referred to the college psychiatric clinic. In both instances the disproportions were more frequent in the "less sound" undergraduates and in the psychiatric clinic cases.

It is suggested that the disproportions are constitutional and as such may indicate a genetic element in the determination of personality and behavior. However, it is pointed out that verification of this supposition must await further study with other groups, in different age levels, and in varying cultural settings.

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A STUDY OF PERSONALITY OF NORMAL YOUNG MEN MAINTAINED ON RESTRICTED INTAKES OF VITAMINS OF THE B COMPLEX¹

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WITH THE COLLABORATION OF

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Valid determinations of vitamin requirements demand examination both of the biochemical and physiological status and of the psychological aspects of "fitness" of human subjects. It is important that personality studies be included. Sub-optimal intakes of the vitamins of the B complex may produce personality changes as these vitamins are involved in enzymic reactions necessary for the integrity of nervous tissues (17). Personality peculiarities, particularly depression and emotional instability, are frequently observed in persons suffering from beri-beri and from pellagra (14). Similar changes have been reported in experimental hypothyroidism (16).

This paper is a detailed report on the relationship between experimentally varied levels of intake of B-complex vitamins and personality. The supplemented subjects were maintained on B-complex levels near those recommended by the National Research Council (12). The experimental group received about one third of the recommended allowances of thiamine and riboflavin and two thirds of niacin during the period of partial restriction. In the period of acute deficiency there were only negligible amounts of the B-complex vitamins in the diet. Details of the experimental program and a summary of the physiological, biochemical, and

other psychological findings have been presented elsewhere (9).

An endeavor was made to examine important aspects of personality, using four techniques:

Reports on the state of well-being: repeated self-ratings and man-by-man ratings.

Detailed questionnaires on physical, social, and emotional status: Minnesota Multiphasic Personality Inventory.

Projective method: Rorschach Ink-blot Test.

Performance under stress: Cattell's Cursive Miniature Situations (C. M. S.) Personality Test.

CONDITIONS OF THE EXPERIMENT

Experimental Program

The experiment consisted of four consecutive parts:

(a) A standardization period of 41 days.

(b) A period of 161 days of partial restriction of the diet in thiamine, riboflavin and niacin.

(c) A period of acute deficiency in these vitamins lasting 23 days.

(d) A 10-day period of thiamine supplementation.

During the prolonged partial restriction, the average daily basic intakes, per 1000 Cal., were 0.185 mg. of thiamine, 0.287 mg. of riboflavin, and 3.71 mg. of niacin. Four men served as experimental subjects and received placebos, while the four controls were given supplements as indicated in Table I. Both groups received daily supplements of other vitamins and minerals to insure adequate intakes. The energy expenditure in this period was about 3300 Cal. per day.

During the acute deficiency all men were fed a synthetic diet composed largely of cornstarch, sugar, vegetable shortening, and purified casein, to which minerals and vitamins were added to produce a balanced diet, except for the B complex. One half of the men previously restricted and one half of those supplemented during the partial restriction received placebos during the acute deficiency. The

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other two pairs were supplemented (Table II).

No foods other than those provided in the controlled diet were taken at any time. All men daily ingested capsules identical in appearance. Neither the subjects nor the psychologists knew which men were controls. The subjects did not appreciate their own status even in the acute deficiency until differentiation between the several groups was well

phasic Personality Inventory at their base camps. The men selected as subjects for the experiment were re-tested after their arrival at the Laboratory. The scores obtained in those two testing sessions varied within the limits of normality except for the high femininity-masculinity interest scores. However, throughout their residence in the Laboratory no evidence of overt homosexuality was present.

TABLE I

DESIGN OF THE EXPERIMENT: B-VITAMIN INTAKE, IN MG. PER 24 HOURS
d = diet, s = supplement, o = placebo

Regimen	Date: 1943	Source	Thia- mine	Ribo- flavin	Niacin	G	Wi	Wa	T	S	Ja	N	Jo
Partial restriction	6/7-11/14	Diet	0.59	0.88	11.80	d	d	d	d	d	d	d	d
		Supplement	1.00	1.00	10.00	o	o	o	o	s	s	s	s
Acute deficiency	11/15-12/7 ¹	Diet	0.03	0.05	0.40	d	d	d	d	d	d ²	d	d
		Supplement ³	1.50	1.50	10.80	o	o	s	s	o	o	s	s
Thiamine supplementation	12/8-12/12	Diet	0.03	0.05	0.40	d	d	d	d	d		d	d
		Supplement	10.00	0.00	0.00	s	s	o	o	s		o	o
		Supplement ³	1.50	1.50	10.80	o	o	s	s	o		s	s
	12/13-12/18	Diet	0.03	0.05	0.40	d	d	d	d	d		d	d
		Supplement	5.00	0.00	0.00	s	s	o	o	s		o	o
		Supplement ³	1.50	1.50	10.80	o	o	s	s	o		s	s
Recommended dietary allowances ⁴			1.8	2.7	18.0								

¹ Saturation-test dose was given to all subjects on December 7, the 23rd day of acute deficiency, at 6:00 p. m. It contained 1 mg. thiamine, 1 mg. riboflavin and 10 mg. niacin.

² Subject Ja developed an upper respiratory infection and was dropped out of the experiment on December 4.

³ In the period of "acute deficiency" and "thiamine supplementation" the control group daily received synthetic vitamins (1 mg. thiamine, 1 mg. riboflavin and 10 mg. niacin) plus 1.2 gr. of dried yeast containing approximately 0.5 mg. thiamine, 0.5 mg. riboflavin and 0.8 mg. niacin.

⁴ These amounts were recommended by the Food and Nutrition Board of the National Research Council for moderately active men of average weight (12).

TABLE II

DISTRIBUTION OF SUBJECTS INTO EXPERIMENTAL AND CONTROL GROUPS

Pairs of men	Status in partial restriction	Status in acute deficiency
G and Wi	Restricted (R)	Deficient (RD)
Wa and T	Restricted (R)	Supplemented (RS)
S and Ja	Supplemented (S)	Deficient (SD)
N and Jo	Supplemented (S)	Supplemented (SS)

established. The environment, physical work, and test regimens were rigorously standardized.

Subjects

The subjects were eight conscientious objectors recruited as volunteers from Civilian Public Service Camps. They were physically normal young men, free from signs or history of abnormalities which might have affected vitamin requirements. Their ages, educational attainment and intelligence scores are given in Table III.

Because it is sometimes thought that non-conformity in social attitudes is associated with personal maladjustment, all men volunteering for the experiment were given the Minnesota Multi-

TABLE III

GENERAL CHARACTERISTICS OF THE SUBJECTS AT THE BEGINNING OF THE EXPERIMENT: AGE, IN YEARS; PERCENTILE SCORE IN PSYCHOLOGICAL EXAMINATION OF THE AMERICAN COUNCIL ON EDUCATION, COLLEGE FRESHMAN 1942 EDITION; AND EDUCATIONAL BACKGROUND

Nutritional status	Restricted				Supplemented			
	RD		RS		SD		SS	
Subject	G	Wi	Wa	T	S	Ja	N	Jo
Age.....	27	21	25	32	22	24	20	23
A. C. E.....	95	81	40	97	91	18	9	75
Years of formal schooling.....	16	15½	14	18	12½	12	12	16

The men were unmarried. They were housed in the Laboratory and spent most of their work and leisure time together. When not engaged in the experimental routine, they worked the remaining portion of their eight-hour day at various jobs in the laboratory, e. g., washing chemical glassware and doing clerical work. Their evenings and Sundays were usually free. They enrolled in a few classes and extension courses at the University, participated in programs of social service agencies, and utilized local recreational facilities.

RATINGS

Method

Deviations from the normal feeling of well-being can be assessed in the form of complaints registered by the subject. Some aspects of the emotional status are reflected in the physiognomy and in overt behavior, and can be observed "from without." Therefore, the status of each subject was described in introspective reports and on the basis of observations provided by the other subjects.

In order to minimize the uncontrolled variables entering into this process, standard rating scales were developed. These were assembled from complaints which are repeatedly mentioned in clinical reports and which form the vaguely defined neurasthenia syndrome. In addition, the scales included some concrete life situations which might create emotional tensions, such as irritation by the other subjects, by staff members, or by laboratory duties. In this way, it was believed, the instrument might fit the laboratory situation more closely. The meaning of the terms used in the rating scales was explained and thoroughly discussed with the group before the experiment was started.

The rating scales are included as Tables IV and V. A score in both the self-ratings and the man-by-man ratings represents a weighted sum of the item points. Weights 0, 1, 2, 3 were used, referring to normality (0), and degrees of departure of the rated item from normality. On computing the scores in the man-by-man ratings, the ratings of each subject by the experimental and by the control group were separated.

Results

The neurasthenic symptoms indicated by the self-ratings showed a very slight increase during the first two months of the partial restriction (Table VI). This increase was present in both the experimental and the supplemented group, and probably reflected the minor difficulties of adjustment to the laboratory regimen. The trend was not progressive and at the end of the partial restriction neither group differed significantly from the initial ratings.

During the period of acute deficiency the average scores of the supplemented group varied within normal limits. In the deficient group there was a sharp rise in subjective complaints, followed by recovery after supplementation (Table VII). An item analysis indicated that the following symptoms were most prominent in the deficiency period: *loss of appetite, tiredness, sluggishness, and blueness.*

The results of the man-by-man ratings agreed

closely with those obtained through self-ratings (Table VIII). During the partial restriction there were no significant differences between the supplemented and the restricted group. In the period of acute deficiency, the average scores for the supplemented group did not exhibit any trend. The vitamin deficient group showed progressive deterioration.

Comment

The value of ratings depends on observational ability and on a disinterested attitude of the observer. Both the intelligence of the subjects and their attitude toward the experiment were such as to justify reliance on the rating scales. The subjects, by living together, had good opportunity for mutual observations. The ratings were made during specially provided times; the relation to meals, work and test regimen was kept constant. The men realized that the ratings were valuable and must be done with care. They were encouraged to use the full rating range of each item. Twice during the experiment each man was interviewed to discuss his rating technique.

On the basis of our experience with these instruments we believe two important improvements in procedure can be made:

1. The subjects should be allowed to refer back to their previous ratings, so that their memory of the feeling of well-being does not have to cover the entire length of the experiment. Their recent ratings can then serve as a basis for judging the trend of changes from the original or "normal" status.

2. Synonyms and detailed qualitative descriptions or definitions should be prepared for each item, in order to insure stability of meaning throughout the long period during which the ratings are repeated.

The rating scales reflected the biochemical differentiation of the supplemented and the deficient subjects, and the changes in scores during the acute deficiency closely paralleled the changing nutritional status. At the end of the acute deficiency three unsupplemented subjects ranked highest in "maladjustment" both on the basis of self-ratings and the ratings by the group. The supplemented group had normal, low self-rating scores; their man-by-man rating scores were also low. The coefficient of rank correlation between the self-rating scores and the pooled man-by-man scores obtained on the 18th day of acute deficiency was $+0.77$. The lack of differentiation within the supplemented group reduced the coefficient.

TABLE IV
SELF-RATING INVENTORY

Name _____ Date _____

How did you feel today?

(Scoring weight)	Check the appropriate column				Special remarks
	Absent or normal (0)	More than usual (1)	Quite a bit (2)	Very much so (3)	
Headache					
Flightiness					
Tiredness					
Out of patience with group members					
Sleeplessness					
Decline of mental alertness					
Decrease of interest in experiment and work					
Nervousness					
Sluggishness					
Backache					
Blueness					
Irritability with work					
Sensations of hot and cold					
Loss of appetite					
"Don't-care" attitude					
Irritated by staff					
Forgetfulness					
Dizziness					
Muscle soreness					
Other unusual things noted					

TABLE V
MAN-BY-MAN RATING INVENTORY

Subject Rated _____ Date _____
Rater _____

How did he act during the last few days?

(Scoring weight)	Check the appropriate column				Special remarks
	Absent or normal (0)	More than usual (1)	Quite a bit (2)	Very much so (3)	
Flightiness					
Out of patience with group members					
Decline of mental alertness					
Decrease of interest in experiment and work					
Nervousness					
Sluggishness					
Blueness					
"Don't-care" attitude					
Irritated by staff					
Other unusual things noted					

MINNESOTA MULTIPHASIC PERSONALITY INVENTORY

Method

In order to compare the scores of our subjects with those of psychiatric patients, the Minnesota Multiphasic Personality Inventory (7, 11) was administered six times throughout the experiment. The inventory consists of 550 statements of psychiatric significance, each printed on a separate card, concerning the subject's physical condition, social relationships, emotional status, etc. A box of these cards was given to each subject during a

specially provided time, so that sorting of the items into *True* and *False* piles would not be done carelessly. At all times the three validating scores—the "cannot say" score ("?"), the lie score ("L"), and the "F" score—were normal. Many of the Multiphasic items refer to a vague period in the patient's past life, as, "I have sometimes felt that difficulties were piling up so high that I could not overcome them." After the initial administration, the subjects were requested to refer only to the period since the last administration of the Inventory whenever possible.

TABLE VI

SCORES IN SELF-RATINGS FOR PARTIAL RESTRICTION
The entries represent averages of two self-ratings made
about 4 weeks apart

Regimen	Subject	Start of diet	Days of partial restriction		
			45	95	135
Restricted	G	2.0	6.0	4.0	4.5
"	Wi	0.0	1.0	4.0	3.5
"	Wa	1.0	0.5	1.5	0.5
"	T	3.0	4.0	2.0	0.5
Restricted mean		1.5	2.9	2.9	2.25
Supplemented	N	1.0	3.5	2.0	2.0
"	Jo	3.0	4.5	2.0	2.5
"	S	1.0	4.0	2.0	1.0
"	Ja	0.0	0.5	1.0	1.5
Supplemented mean		1.25	3.1	1.75	1.75

TABLE VII

SCORES IN SELF-RATINGS FOR ACUTE DEFICIENCY

Regimen	Subject	Days of acute deficiency				Days of B ₁ supple- mentation
		4	11	18	23	
RD	G	6	12	12	9	7
RD	Wi	1	14	14	21	0
SD	S	0	11	10	22	5
Deficient mean		2.3	12.3	12.0	17.3	4.0
RS	Wa	1	1	1	1	2
RS	T	0	3	2	3	3
SS	N	2	1	3	5	3
SS	Jo	3	2	1	2	2
Supplemented mean		1.5	1.8	1.8	2.8	2.5

was most clear in the triad of scales D, H_{ss}, and H_y. The three complaint patterns represented—depression, hypochondriasis, and hysteria—include the clinical symptoms usually classified as psychoneurotic. It has been common clinical experience to find a tendency for adverse personality traits to be more evident when a patient becomes depressed. The moderate rise in other scales, such as schizophrenia, probably was due to this relationship.

The profiles for the four control subjects also rose on the administration of the Inventory at the end of the period of acute deficiency. The rise, while not nearly so great as in the case of the deficient group, is probably reliable and real. A diet which is necessary to exclude all B vitamins is exceedingly monotonous. In addition, there was the suggestive influence from the men in the deficient group. The latter men changed so radically that it would have been difficult for the control group not to feel an implied threat. They could not be sure that severe changes would not appear in them.

An analysis of the items which distinguished the supplemented men from the deficient group during the acute period was made. About half of the total number of these items was common to all persons in the deficient group and referred to physical complaints. The other half of the items were psychological rather than somatic and were

TABLE VIII

AVERAGE SCORES IN MAN-BY-MAN RATINGS FOR PARTIAL RESTRICTION AND ACUTE DEFICIENCY
The entries for the partial restriction represent averages of two ratings made about four weeks apart

Rating of:	Ratings by	Start of diet		Days of partial restriction					
		S	R	44		88		152	
				S	R	S	R	S	R
Restricted group.....		0.13	0.38	0.44	0.63	0.63	2.19	0.50	1.06
Supplemented group.....		0.13	0.44	0.00	0.94	0.38	0.88	0.57	1.25
Rating of:	Ratings by	Days before Acute Deficiency		Days of acute deficiency					
		S	D	4		11		19	
				S	D	S	D	S	D
Deficient group.....		0.44	0.22	0.56	0.50	3.44	2.33	6.44	4.17
Supplemented group.....		1.17	1.33	1.00	0.63	1.75	1.19	0.92	1.00

Results

The Multiphasic data for the period of partial restriction are presented as mean scores (Table IX). There was no manifest change in either group. However, in the testing made after 22 days of acute deficiency, the unsupplemented subjects obtained strikingly high scores (Table X). The effect

widely scattered among the possible abnormal responses on the three psychoneurotic scales.

The trend of the Multiphasic scores agreed closely with that of the self-ratings and the man-by-man ratings. The test adds to the weight of evidence that there was no noticeable change of personality status during the partial restriction but

TABLE IX

MINNESOTA MULTIPHASIC PERSONALITY INVENTORY FOR PARTIAL RESTRICTION

Averages of the standard scores (normal average = 50, 1 S. D. = 10) on the following scales: hypochondriasis (Hs), depression (D), hysteria (Hy), psychopathic deviation (Pd), masculinity-femininity (Mf), paranoia (Pa), psychasthenia (Pt), schizophrenia (Sc), and hypomania (Ma).

Scale	Days before partial restriction				Days of partial restriction					
	51st day		18th day		43rd day		88th day		151st day	
	Restr.	Suppl.	Restr.	Suppl.	Restr.	Suppl.	Restr.	Suppl.	Restr.	Suppl.
Hs.	43	46	43	46	44	46	42	46	44	49
D.	52	46	54	51	57	56	58	52	58	50
Hy.	54	49	61	52	60	60	59	57	60	56
Pd.	49	43	50	42	51	50	58	46	52	48
Mf.	68	58	76	56	69	61	71	64	68	62
Pa.	53	45	55	47	56	52	61	52	59	48
Pt.	50	45	51	47	49	46	53	45	51	47
Sc.	52	47	50	49	51	50	54	48	51	48
Ma.	54	48	51	51	53	52	54	52	50	54

TABLE X

MINNESOTA MULTIPHASIC PERSONALITY INVENTORY FOR ACUTE DEFICIENCY

			151st day of partial restriction (11th day before acute deficiency)								
Scale	Regimen	Subject	Hs	D	Hy	Pd	Mf	Pa	Pt	Sc	Ma
Restricted.....		G	40	72	51	65	76	62	63	67	54
Restricted.....		Wi	47	60	62	47	63	62	53	53	66
Supplemented.....		S	51	41	53	50	55	41	46	52	61
Supplemented.....		Ja	(56)	(56)	(64)	(58)	(80)	(53)	(39)	(45)	(52)
Mean.....		...	46	58	55	54	65	55	54	57	60
Restricted.....		Wa	47	56	67	53	57	56	42	40	39
Restricted.....		T	42	46	58	45	76	56	45	44	41
Supplemented.....		N	42	53	49	40	51	47	56	47	37
Supplemented.....		Jo	47	51	60	42	61	53	46	47	66
Mean.....		...	44.5	51.5	58.5	45	53	53	47	44.5	46
			22nd day of acute deficiency								
	Regimen	Subject	Hs	D	Hy	Pd	Mf	Pa	Pt	Sc	Ma
Restricted-deficient.....		G	62	89	71	73	82	67	66	68	52
Restricted-deficient.....		Wi	90	80	91	65	82	65	68	65	70
Supplemented-deficient.....		S	88	92	86	65	68	56	68	75	61
Deficient mean.....		...	80	87	83	68	77	63	67	69	61
Restricted-supplemented.....		Wa	60	56	78	55	57	59	42	44	43
Restricted-supplemented.....		T	67	63	69	47	80	56	46	51	52
Supplemented-supplemented...		N	58	80	67	53	55	50	59	51	32
Supplemented-supplemented...		Jo	47	48	60	40	67	56	42	47	59
Supplemented mean.....		...	58	62	68.5	49	65	55	47	48	46.5

that important changes occurred in the period of acute deficiency.

Comment

The Multiphasic scores suggest that depression was most prominent. There were certain hypochondriacal and hysterical features in addition. It appears that the deficient men did not exhibit a specialized pattern of personality deterioration specific to the B-complex deficiency but became indistinguishable from many neurotic patients.

Further analytical work on larger groups of deficient subjects may reveal special characteristics in the personality change with B-complex deficiency but, within the limits of this experiment, the similarity is most marked.

RORSCHACH TEST

Method

The self-ratings depend upon the subjects' awareness of deviations from a normal state of well-being. The negative findings during the partial restriction

indicate that the subjects were not conscious of any changes. However, in borderline deficiencies personality changes may be induced so slowly that the subjects may be entirely unaware of them. Hence, a personality assessment which is quite independent of the subjects' estimate of their status was needed. The Rorschach test constitutes such an indirect method of obtaining this information, with the characterization of personality being based on the responses given to standard ink-blot.

In this test the subjects' task is merely to report what the "pictures" look like or remind them of. The total of Rorschach responses is a sample of their behavior in a standardized situation and there need be no self-awareness of the change in order to secure a changed Rorschach record. The subjects do not know the psychological significance of their responses and thus cannot consciously influence or falsify their records.

The Rorschach test was given three times: at the beginning of the partial restriction, at its end, and at the termination of the acute deficiency. The procedure for group testing was employed (5, 6); instead of using photographic reproductions, however, actual Rorschach cards were used. The responses were recorded by the subjects on the group-Rorschach blanks which later were sent for analysis to M. R. Harrower at Madison, Wisconsin. The records were scored according to the system utilized by Klopfer (10) and the usual calculations were made in full for each record. They are summarized in Table XI. Personality descriptions of the individuals based on the three successive records then were written; in the *Results*, passages taken from these original descriptions are italicized. At no time did Dr. Harrower have personal contact with the subjects, nor was their nutritional status known to her when the original reports were made.

Results

Work has been done on the effect of repeating the Rorschach (6, p. 140-150) which enables us to distinguish the effects due to repetition as contrasted with changes due to other causes. For example, repetition produces almost invariably an increase in the total number of responses. Therefore, it is not surprising to find that all eight subjects, regardless of their nutritional status, had a larger number of responses in their second record. Taking into account the uniform changes, we may ask whether the successive records indicate alterations in personality. The records will be discussed in pairs with the men grouped according to their nutritional status.

Jo and *N* (supplemented-supplemented): The subjects who were supplemented during both the partial restriction and the acute deficiency had different personality structures, as reflected in the initial Rorschach: *Jo*'s record was relatively good; *N*'s record, poor. The three records of *N* showed no essential change. In this case the personality pattern did not improve during the six month period of relatively good nutrition. The second record of *Jo*, on the other hand, improved slightly, the initial tenseness and lack of spontaneity being lessened. In the third record a still more positive attitude towards the environment appeared.

Ja and *S* (supplemented-deficient): In both *Ja* and *S* the second record showed an improvement, while the third record of subject *S* indicated that the 22 days of adverse nutritional conditions did not introduce any significant change in the Rorschach responses. The third record of subject *Ja* could not be obtained.

Wa and *T* (restricted-supplemented): These men presented very different personality patterns at the start. *Wa*'s first record was not a very satisfactory one; the record of *T* was better. In the case of *Wa* a negative change occurred in the period of partial restriction: in the second record, *he was driving himself with a tight rein, being more punctilious and paying greater attention to detail, showing more anxiety and less spontaneity*. The third record showed some relaxation of the tension. The same does not hold for subject *T*, whose three records were similar one to another.

Wi and *G* (restricted-deficient): In the case of *Wi* there was a change between the initial and final records. The third record indicated *considerably more constriction, as if the individual was having to watch his step more carefully or was combating some difficult situation*. This tendency was already indicated in *Wi*'s second record. The second and third records of *G* also reflected negative change, conscious control having been slightly increased. Although not demonstrated in Table XI, in *G*'s records II and III there appeared an *increased preoccupation with bodily sensations*.

Comment

The hypothesis that good nutritional conditions will always produce a "better" personality picture, while restriction will invariably make for deterioration, is clearly not substantiated. Except in the case of *Wa*, no marked changes in personality structure were indicated. There are, nevertheless, indications that some of the other subjects whose

TABLE XI
GROUP RORSCHACH

Response Key: R = total number of responses in a record; W% = percentage of whole responses; F% = percentage of responses determined only by form; M = number of human movement responses; C = color score computed by assigning 1.5 to pure color responses, 1.0 to color-form responses, and 0.5 to form-color responses; FC = number of responses determined both by form and color; CF = number of responses determined by color primarily and form secondarily; FM = animal movement responses

Subject	Record	Nutritional status	Type and frequency of response								
			R	W%	F%	M	FC	CF	M:MF	FC:CF	M:C
G	I	Restricted.....	32	41	28	2	3	6	2:4	3:6	2:7.5
	II	Restricted.....	49	39	27	1	7	4	1:7	7:4	1:7.5
	III	Restr.-def.....	46	24	33	1	7	5	1:9	7:5	1:8.5
Wi	I	Restricted.....	25	52	16	4	6	3	4:3	6:3	4:6
	II	Restricted.....	40	40	38	4	4	5	4:2	4:5	4:7
	III	Restr.-def.....	58	17	55	2	4	3	2:6	4:3	2:6.5
S	I	Supplemented...	44	20	45	2	4	4	2:6	4:4	2:6
	II	Supplemented...	55	11	36	7	9.5	1	7:7	9.5:1	7:6
	III	Suppl.-def.....	50	10	30	7	6.5	2	7:9	6.5:2	7:5.5
Ja	I	Supplemented...	22	41	36	0	2	2	0:3.5	2:2	0:3
	II	Supplemented...	39	26	56	4	1	2	4:3	1:2	4:2.5
	III	Suppl.-def.....	..	..	..	..	..	..	...	...	...
Wa	I	Restricted.....	12	58	33	0	1	1	0:4	1:1	0:1.5
	II	Restricted.....	31	0	94	0	0	0	0:1	0:0	0:0
	III	Restr.-suppl....	35	0	83	0	1	1	0:3	1:1	0:1.5
T	I	Restricted.....	25	71	29	2	4	1	2:6	4:1	2:3
	II	Restricted.....	35	49	29	3	5	0	3:15	5:0	3:2.5
	III	Restr.-suppl....	31	42	23	2	5	0	2:16	5:0	2:2.5
N	I	Supplemented...	12	58	25	0	1	4	0:1	1:4	0:4.5
	II	Supplemented...	17	29	24	0	2	3	0:2	2:3	0:4
	III	Suppl.-suppl....	27	11	22	1	2	4	1:4	2:4	1:5
Jo	I	Supplemented...	26	88	69	3	2	1	3:0	2:1	3:2.5
	II	Supplemented...	43	30	56	4	2	0	4:3	2:0	4:2
	III	Suppl.-suppl....	43	21	53	3	4	2	3:3	4:2	3:4

TABLE XII
SUMMARY EVALUATION OF RORSCHACH RECORDS

Subject	Nutritional status	Initial personality calibre—record I	At end of partial restriction—record II	At end of acute deficiency—record III
G	Restricted-deficient.....	"Fair"	Negative change	Further negative change
Wi	Restricted-deficient.....	"High"	Negative change	Further negative change
S	Supplemented-deficient.....	"High"	Positive change	No further change
Ja	Supplemented-deficient.....	"Low"	Positive change	No record made
Wa	Restricted-supplemented.....	"Low"	Negative change	Small positive change
T	Restricted-supplemented.....	"High"	No change	No change
N	Supplemented-supplemented...	"Low"	No change	No change
Jo	Supplemented-supplemented...	"High"	Positive change	Further positive change

vitamin intake was reduced were forced to introduce greater vigilance over their behavior, becoming more constricted and tense. On the other hand good conditions continuing over a period of time, in the "better" personalities, allowed further development of positive aspects of the individual, as summarized in Table XII. This finding, that some personality types are better able to resist

stress, has been confirmed by others. Under oxygen deprivation "individuals who are rigid, anxious, not very dependent on themselves and inhibited in their responses react poorly to the high altitude situation . . . individuals well integrated with respect to the use of their inner resources and responsive to external stimulation react best of all." (8, p. 322).

CURSIVE MINIATURE SITUATIONS TEST

Method

Cattell's Cursive Miniature Situations Test (CMS) was designed to measure non-intellective, "dynamic" effectiveness of personality (1, 3). It tests individuals in standardized performance situations. The subject is continuously presented with new and varied tasks solved by making marks on a moving strip of paper. The way in which the subject handles the situations is taken as an indication of his cautiousness, emotionality, resourcefulness, patience, etc. Consequently, it was reasonable to expect that this test would indicate neurasthenic

TABLE XIII

GENERAL PERFORMANCE IN CATTELL'S CURSIVE MINIATURE SITUATIONS (CMS) TEST

Score = percentage of total possible correct responses

	Days of partial restriction					
	32	55	81	101	131	157
Restricted mean.....	74	79	81	78	83	90
Supplemented mean .	66	64	75	79	79	80
	Days of acute deficiency				Days of B supplementation	
	5	12	19	23	10	
Deficient mean.....	83	86	84	86	88	
Supplemented mean .	87	86	88	88	88	

traits reported in clinical B-complex deficiencies and found in the present experiment by the ratings and the Multiphasic Inventory. The test was scored in two ways: (a) The *general* score represents over-all effectiveness in the test; (b) the *special* scores were obtained by evaluating the person's performance for such characteristics as soundness of rapid decision and self-control in withholding certain "trumps" until they were really required.

During the partial restriction a different test-strip was presented in successive testing sessions three to four weeks apart. The rate of presentation was 140 seconds for the 15 inch strip. During the acute deficiency, the strip was doubled in length and speeded up, so that the time per 15 inches of strip was 105 seconds. In order to make successive trials more nearly comparable, the identical pair of strips was used at each weekly trial during the acute deficiency.

Results

The *general* score indicates that there was no significant change in performance in either the period of partial restriction or the period of deficiency (Table XIII). One of the *special* scores, an "emotionality" index, consists of the number of

erroneously crossed, slanting lines. This index began to increase albeit very slightly in the restricted group in the second half of the partial restriction. It continued to increase (Table XIV) in the experimental subjects during the acute deficiency, but this tendency was not statistically significant. In another index of "emotionality," the effective use of the limited supply of trumps, there was no change. A "timidity" score, expressing the disturbance of performance caused by an inserted surprise instruction, suggested that the experimental group during the acute deficiency was more affected than the control group (Table XIV). This difference was not statistically significant.

TABLE XIV

SPECIFIC PERFORMANCE IN CATTELL'S CURSIVE MINIATURE SITUATIONS (CMS) TEST

	Days of acute deficiency				Days of B supplementation
	5	12	19	23	10
"Emotionality" score					
Deficient mean.....	15.7	16.0	20.7	25.0	18.7
Supplemented mean	14.5	11.5	14.2	16.0	11.7
"Timidity" score					
Deficient mean.....	1.08	1.20	1.44	1.18	1.09
Supplemented mean	1.24	1.30	1.22	1.25	1.22

The "emotionality" score = number of forbidden slanting lines crossed.

The "timidity" score = ratio of points made in comparable tasks before surprise to those made after surprise.

Comment

The *general* scores have been shown in a previous study to distinguish psychotics and convicted criminals from normal controls. Also, manic-depressives differed significantly from schizophrenics (1). The lack of deterioration of the general effectiveness of performance during the acute deficiency in this experiment suggests that no psychotic behavior was produced. This is consistent with the lack of significant changes on the psychotic Multiphasic scales.

In Cattell's previous work (3) the *special* scores yielded positive correlations with rated personality traits. Ratings of general "emotionality" correlated 0.45 with the number of erroneously crossed slanting lines and 0.55 with the total number of trumps used. In the present experiment the deficient group tended to increase errors made by crossing the forbidden slanting lines. The handling of the trumps did not become less efficient. Cattell also found that ratings on "timidity" correlated 0.72 with the prudent use of trumps and 0.50 with disturbance of

performance by surprise instructions. In this experiment the use of trumps did not change, even during the acute deficiency. There was some disturbance of performance by the surprise insertion of new and contradictory instructions. The changes in the special scores on the CMS in acute deficiency were surprisingly small in view of the large changes in the feeling of well-being. A significant change was expected especially in the behavior in surprise situations as this "timidity" score has been tentatively related to the personality factor named "sensitive, anxious emotionality" which has more somatic associations than other personality factors (2).

DISCUSSION

The systematic study of personality in subjects maintained on restricted levels of vitamin intake is of interest from the point of view of both nutritional science and psychopathology. In attempts to determine the human requirements for the vitamins of the B complex, assurance must be had that the given level of vitamin intake does not affect the feeling of well-being and does not produce personality deterioration. On the other hand, maintenance on a deficient diet changes the individual physiologically and provides a rare opportunity for the study of psychological changes resulting from known and experimentally varied biochemical alterations.

A whole yearly meeting of the Association for Research in Mental and Nervous Diseases was recently devoted to considerations of the effects of nutritional deficiencies on personality (13). In this symposium, the vitamin B-complex received particular attention. Even a cursory survey of the materials presented reveals that the experimental study of behavioral alterations is considerably less advanced than clinical and biochemical research on the effects of B-vitamin restriction. The present experiment was an attempt to investigate the effect of reduced B-complex intakes on various aspects of personality by using standardized, quantitative techniques in a nutritionally well-controlled situation.

In designing a controlled experiment on the personality changes induced by restricted B-complex intakes, it was possible to overcome some of the handicaps usually present in the clinical situation. The subjects were studied before, during and after the restriction, so that each person could serve as his own control. The clinician usually has the opportunity to observe the patient only after he has sought medical aid. Our subjects were observed for long periods of time and large segments of

their behavior could be studied. Under pressure to meet many practical demands the clinician does not have time for such intensive observations. The use of observational techniques standardized on known populations, such as the Minnesota Multiphasic Personality Inventory, allowed for a meaningful characterization of the subjects before they were exposed to the experimental regimen, and, at the same time, made it possible to evaluate the degree of deterioration against a background of psychiatric abnormalities.

In general, the results obtained by the various procedures used in this experiment are consistent with each other. During the five months of partial restriction both the ratings and the Multiphasic did not indicate deterioration. The general scores on the CMS test were not affected; an "emotionality" score showed an insignificant rise. The Rorschach test provided evidence of slight changes, paralleling the slight increases in the resting level of pyruvate acid which was taken as a specific indication of borderline dietary deficiency in the group on low vitamin intake (9). The fact that the Rorschach analyses were made "blindly," without knowledge of the subjects' nutritional status, increases confidence in the results. It is methodologically important that these slight changes did not have a counterpart in the data obtained by the questionnaire-type procedures, *i. e.*, the Multiphasic and the self-ratings which demand awareness of the changes.

In the period of acute deficiency, profound changes were indicated by both the self-rating, and the man-by-man ratings which showed a sharp rise in the "neurasthenic" symptoms. The Multiphasic scores on depression, hypochondriasis, and hysteria showed significant departure from normality. The Rorschach reflected an increase in conscious control over behavior in two out of the three deficient subjects. The CMS test indicated some increase in "emotionality" and "timidity."

In the acute deficiency the lack of pronounced psychopathic findings on the Rorschach correlates with lack of deterioration in the general CMS scores and the relatively small rise of the scores in the psychotic scales of the Multiphasic. On the Multiphasic psychoneurotic scales half of the deviate items referred to physical discomforts. There was no evidence of anxiety neurosis (4) in the breathing records obtained in determining basal metabolic rates of the experimental subjects. These findings suggest that the neurasthenic tendencies were not profound pathological phenomena. The rapid re-

covery upon thiamine supplementation supports this interpretation.

In general the psychometric results agree with the observations of the experimenters. In the partial restriction no changes were noticed by members of the staff. In the period of acute deficiency the outstanding characteristic was apathy with disinclination to spontaneous physical or mental activity. The deficient men spent much of the time not occupied by tests and other scheduled activities lying in bed. However, even at the depth of deficiency the subjects were able to cooperate fully in the testing procedures and other experimental routine. It should be noted that the changes in the state of well-being appeared very early in the acute deficiency, just following the development of anorexia. The psychomotor, metabolic, neurological, and cardiovascular changes appeared later (9).

In the *early* stages of pellagra the neurasthenic symptoms as well as the impairment of cortical functions—concentration, memory, comprehension—are regarded as resulting from a concomitant thiamine deficiency (14). Other authors concur in the opinion that the psychological components of multiple B-complex deficiencies are mainly attributable to thiamine inadequacy (15). In the present study, too, the disturbances in the feeling of well-being were cleared by the supplementation of the deficient subjects with thiamine alone.

SUMMARY

1. Various aspects of personality were studied in eight normal young men maintained 161 days on a partially restricted intake of B-complex vitamins, which was followed by 23 days of acute deficiency, and 10 days of thiamine supplementation.

2. Self-ratings and man-by-man ratings gave no evidence of change in the status of well-being and adjustment during the partial restriction, but indicate consistent and striking deterioration during the acute deficiency. Supplementation of the diet by thiamine alone produced rapid recovery.

3. The Minnesota Multiphasic Personality Inventory also gave no evidence of change in the partial restriction. During the acute deficiency, significant changes were obtained in the scores on the three psychoneurotic scales—depression, hysteria, and hypochondriasis.

4. In the Rorschach test records made at the end of the partial restriction slight deteriorative changes were indicated in three out of the four experimental subjects. These changes increased in magnitude in the pair of subjects placed subsequently on the acutely deficient diet. The nature

of this deterioration was loss of spontaneity, with an increase in tension. The Rorschach findings suggested that individuals with "better" initial personality were better able to resist the dietary stress.

5. Cattell's Cursive Miniature Situations Test during the partial restriction indicated a very slight and statistically *not* significant increase in the number of lines erroneously crossed ("emotionality" score). During the acute deficiency, there were evidences of further increased "emotionality" and "timidity." On the other hand, those indices which have distinguished psychotics from normals showed no change in our deficient subjects.

6. The personality changes were among the earliest symptoms of the experimentally produced borderline and acute deficiencies.

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LETTER TO THE EDITOR

Our readers may be interested in the following excerpt from a letter written by Dr. J. Groen of Amsterdam:

"I take the liberty of writing you as editor of *PSYCHOSOMATIC MEDICINE*. I am a former fellow of the Rockefeller Foundation. In 1935-36 I worked with Dr. Minot and Dr. Castle at the Thorndike Memorial Laboratory in Boston. When Holland was invaded by the Germans I occupied the position of chief assistant in the Department of Medicine of the University of Amsterdam. My chief was Professor I. Snapper, who is now head of the Division of Medicine of the Mt. Sinai Hospital, New York.

"Shortly after the German invasion I lost my University position and with it the possibility for laboratory research as I had done up till then. This circumstance forced me to look out for a line of research that could be carried out with the simplest means. I had seen your book on 'Emotions and Bodily Changes.' I had read Murray's paper on the Etiology of Ulcerative Colitis and Draper and Touraine's article on Psychogenetic Factors in Peptic Ulcer. Dr. V. D. Heijden (who is now working in Chicago) drew my attention to the work of Alexander and his school.

"Originally driven more by circumstances than by conviction I began to take life histories of all sorts of patients with internal diseases. To my great surprise I found out that the character traits and emotional conflicts which the American authors had described were the same as I found in my patients. As an internist without analytical training my methods of approach were different. It was more like ordinary history-taking on an extensive scale, so that the histories got the character of life stories.

"Encouraged by these results I drew other diseases into the scope of this investigation. As a result I have written two papers, one on ulcerative colitis and one on peptic ulcer, both in the size of small monograph. I have also written a paper containing a number of life histories of my asthmatic patients. However, this has not been translated into English yet. From an announcement on the cover of the last copy of *PSYCHOSOMATIC MEDICINE* that reached Holland, I had seen that Alexander has published a monograph on 'Psychogenic Factors in Bronchial Asthma.' This monograph, if it has come out in the U. S. A., has not reached Holland so far. It will be very interesting to see if the character traits and emotional conflicts I have found with the method of 'biographical history-taking' in patients in the Netherlands are the same as Alexander has discovered by psychoanalysis in Chicago."

INDIVIDUAL PSYCHOTHERAPY *

FRANZ ALEXANDER, M.D.

We consider a therapeutic procedure scientifically founded if it is based on the knowledge of the disease which it attempts to remedy and on the understanding of the curative process itself. Such a treatment we call etiological in contrast to merely empirical procedures. These are treatments which effect cures or improvements without our understanding why and how such results are achieved.

Psychotherapy only very recently advanced into the rank of etiological therapies. On the other hand, even in its most primitive form, psychotherapy never has been a completely empirical procedure. Everyone who tries to console a despondent friend, calm down a panicky child in a sense practices psychotherapy. He tries by psychological means to restore the disturbed emotional equilibrium of another person. Even these common sense, everyday methods are based on the understanding of the nature of the disturbance, although on an intuitive and not a scientific understanding. Talking over with a person an acute harassing experience is based on the instinctive knowledge of the curative effect of abreaction. Giving advice and assuming a firm attitude again is based on the instinctive knowledge that the panicky and confused individual needs emotional support which we can give him by allowing him to lean on us. We also know intuitively that a person who is overwhelmed by a threatening situation cannot use his reasoning faculties effectively and therefore we try to calm him down by giving him support. At the same time discussing with him the objective situation, we lend him our own reasoning faculties. Doing all this, we then practice a combination of supportive and insight therapy. It is not exaggeration, therefore, to say that the most of the therapeutic factors, such as emotional support, abreaction, insight, persuasion, and above all, the transference, are consistently used by everyone in his everyday life. Methodical psychotherapy to a large degree is nothing but a systematic, conscious application of methods by which we influence our fellow men in our daily life. The most important difference is that intuitive knowledge is replaced by the well established general principles of psychodynamics.

* Delivered before the New York Regional Meeting of the American Society for Research in Psychosomatic Problems at the New York Academy of Medicine, May 11, 1945.

Psychoanalysis as developed by Freud is the most elaborate attempt to place psychotherapy on such generally valid psychological principles. What differentiates psychoanalytic therapy from other procedures, for example DuBois Raymond's "Persuasion Therapy," or the different forms of suggestion—waking and hypnotic—is that psychoanalysis is based on a consistent theory of the structure and functioning of the human personality and on well established psychological principles.

In order to formulate the general principles of etiologically orientated psychotherapy, it is of advantage to review from a bird's eye view the development of psychodynamic knowledge. The recognition by Freud and Breuer of the therapeutic value of discharging emotions in the hypnotic state can be considered as the first milestone of this development. Traumatic experiences which the Ego could not face when they occurred become repressed and can be mobilized in the hypnotic state: the repressed emotions are discharged and symptomatic relief follows. While experimenting with this technique of hypnotic catharsis, Freud recognized that the main therapeutic issue consisted in restoring the Ego's capacity to face traumatic memories together with the accompanying emotions. During hypnosis the Ego's functions to a large degree are eliminated. This is best seen by the almost complete absence of independent judgment. The Ego is to a large degree temporarily absent; hence the patient's ability during hypnosis to remember and to express those emotions which are otherwise blocked by the Ego. In search of a method by which the Ego functions are fully retained and yet the repressed emotions can be brought to consciousness, Freud discovered at first the method of free association and then the significance of the patient's emotional reactions directed to the therapist. Under the method of free association, the patient's conscious control over his thought processes is somewhat reduced and this shifts the equilibrium in favor of the repressed forces and thus the emotions rejected by the Ego can gradually find expression. In the method of free association, it became obvious that the therapeutic effect is based on the steadily increasing capacity of the Ego to deal with hitherto repressed emotions. The patient's confidence and reliance upon the analyst encourage

the Ego to face those emotional constellations with which it could not deal in the past.

The most important forward step in the development of psychoanalytic therapy, however, was based on what is probably Freud's most important discovery, that of the transference. In the free encouraging atmosphere of the psychoanalytic session, the characteristic emotional reaction patterns find unadulterated expression. These emotional reactions of the patient toward the psychotherapist represent the repetition of the same emotions and conflicts which the patient had toward his parents and which he now transfers toward the therapist. This is nothing less than the revival of the neurotic past in the form of an experimental neurosis of the present. Freud called this experimental neurosis as it develops during the treatment "transference neurosis" and its resolution became the aim of therapy.

The transference neurosis as a dynamic reenactment of the pathogenetic past now became the basis of modern psychoanalytic therapy. Freud recognized the immense therapeutic possibilities that this revival of past emotional difficulties offered for therapy. In the transference neurosis the original conflicts appeared in much smaller quantities. Moreover, not only was the intensity of the transference emotions smaller than that of the original ones, but now the stronger Ego of the adult was exposed to the same type of conflict which had overpowered the weak, infantile Ego in the past. In the transference situation the patient has a splendid opportunity to grapple once more with the same emotional difficulties which he had not been able to master in the past—with his envy mixed with admiration and gratitude felt toward his father, older brother or other rivals; with the guilt feelings and anxieties which followed his envy and hostility; with his dependent, help-seeking attitude he felt toward his mother together with all his embitterment and resentment when his demands for love were not fulfilled and with his rebellion against maternal over-protection. After Freud recognized that all the deeply-ingrained emotional patterns of the patient, the whole infantile nucleus of his personality, gradually became freely expressed during the treatment as the patient's later acquired defenses against them are analyzed, the transference became the center of the whole therapeutic procedure.

It took about another fifteen years for psychoanalytic therapy, after Freud's discovery of the significance of the transference, to emancipate itself from the first impressive formulations of the

cathartic hypnosis and to become transformed into a procedure aimed at achieving permanent changes in the Ego's functional capacity ("Ego-analysis").

The search for forgotten memories, and the intellectual reconstruction of the past history, gave place more and more to the consistent utilization for therapeutic purposes of the emotional experiences of the patient in relation to the physician. Psychoanalytic therapy became in a sense a prolonged emotional training of the Ego.

Every form of etiologically orientated psychotherapy is based on the same principles which are used in a highly standardized manner in the psychoanalytic technique. It aims to restore the failing functions of the Ego through emotional support and insight. This becomes possible by mobilization of repressed emotions. To describe the common feature of all sound psychotherapeutic procedures, it is necessary at first to describe the functions of the Ego in some detail.

When we speak of the Ego we refer to the organ system whose anatomical and physiological substratum is the highest integrative centers of the central nervous system. The functioning of this organ system can be studied both by the methods of anatomy and physiology and by those of psychology. When we refer to these functions of organism by speaking of the Ego and Ego functions, we always mean the psychological approach.

In the Ego's functions two kinds of activities can be distinguished: a perceptive and an executive activity. The *perceptive* faculty is again two-fold: 1) *internal perception*—the registration of the subjective needs and impulses of the organism—and 2) *external perception* by the sense organs of the environment. These two functions find expression in the anatomical-physiological structure of the central nervous system and correspond to its afferent nervous pathways.

The *executive function* of the Ego consists in finding ways and means for the gratification of the subjective needs of the organism by adequate activities effected through the efferent nervous pathways.

The perceptive and executive functions of the Ego are interrelated inasmuch as the executive function is dependent upon the perceptive faculties: the Ego must at first register the subjective needs in order to gratify them, and it must inform itself about the existing external conditions because the gratification of subjective needs depends upon external conditions. In order to satisfy the need for nourishment, this need must be perceived as hunger and then the food must be discovered in the

environment. Only then can the executive function—the finding of adequate ways and means to satisfy the hunger—be successfully fulfilled. The confrontation of the results of internal and external perception with each other and the executive activity based upon this confrontation we call the integrative function of the Ego. This consists in the complex, harmonious coordination of simultaneously existing, partially conflicting subjective needs and impulses with each other and with the external conditions upon which their gratification depends. This activity was first described by Freud as “reality principle” and later analyzed in its finer details by French in his studies on goal structures.

This complex synthetic function of the Ego can be disturbed in different ways. This accounts for the various types of mental disturbances. Briefly one can divide the different types of disturbances in the following groups:

I. *Psychiatric Conditions Due to Organic Changes of the Brain:* In these cases the Ego functions are disturbed because the brain tissue is altered by mechanical, infectious or toxic influences or by the progressive degeneration due to aging process. In such conditions psychotherapy has only an accessory and occasional application.

II. *Psychiatric Conditions Due to Injurious Experience in Inter-Personal Relationships:* These may be acute or chronic:

(a) *Acute Conditions:* Under the influence of excessive emotions, particularly anxiety, but also rage, grief, and frustration, the Ego's integrative functions may be temporarily impaired. Every one experiences occasionally the paralyzing effect of anxiety upon his ability to act rationally. Excessive rage also makes a person act in a way which is out of harmony with his accepted standards and existing interests. Under excessive emotions behavior becomes irrational; it is directed mainly to relieve the immediate tension irrespective of consequences. At the present moment, the most common examples are the different forms of war neurosis. But also in peace time such acute neurotic disturbances are not infrequent. They may assume almost any form: acute depressions, anxiety states, hysterical conversion symptoms, vegetative neuroses, etc., which may develop in often quite well adjusted persons when they are exposed to overpowering life situations, which are beyond their capacity to master. In such acute conditions, the primary aim of therapy consists in reducing the intensity of the disturbing emotions by *emotional support*. The Ego functional capacity is fundamentally intact and is only temporarily impaired by excessive emotions.

In such supportive psychotherapy, sedatives may be also of considerable value. Since in acute emotional situations the Ego's perceptive functions—the faculty of clear analysis of the external situation and also the ability to weigh and coordinate emotional needs is likely to be impaired, the therapist can help in *giving intellectual insight* by clarification of the emotional issues and existing external circumstances involved. It is important to remember that acute conditions if not treated are likely to become chronic, because the failure to meet actual life situations has a demoralizing effect upon the Ego and may mobilize poorly resolved conflict situations of the past. Once the Ego fails in one situation, all functions of mastery break down. This explains why in traumatic neurosis the patient may lose the most basic faculties of mastery, such as walking, speaking, in fact all coordinated movements, and regress to the completely helpless state of infancy. The regressive tendency is omnipresent in everyone and when life conditions become difficult, the tendency to return to the less responsible and more secure situations of childhood is encouraged. Such regressive evasion of the present is an integral part of every neurosis and psychosis. Early treatment of acute conditions by restoring self-confidence and thus blocking the more extended breakdown of the integrative function is therefore of primary importance.

(b) *Chronic Conditions:* Chronic failures of the synthetic Ego functions develop insidiously under the influence of interpersonal relations. The disturbing experiences may start in early childhood or later. Conflicts centering around early sexual and hostile impulses as they appear in the family situation are the most common causative factors. In such cases merely supportive therapy is of little value and the uncovering types of psychotherapy are indicated. In these we expose the Ego in the treatment situation again to the original types of emotional constellation which it could not resolve in the past. The revival of the original conflicts in the transference situation gives the Ego a new opportunity to grapple with the unresolved conflicts of the past. Independent of the form of this kind of therapeutic approach—whether it consists of prolonged daily interviews or briefer application of psychoanalytic principles—all uncovering psychotherapy is based on what might be called the principle of “*corrective emotional experience*.” The pathological effect of earlier emotional experiences is corrected by exposing the patient to the same type of emotional conflicts in the therapeutic situation. The therapist, however, reacts differently,

not as the parents, teachers, relatives, or friends in the past. This difference between the therapist's reaction from the original parental reactions is the most fundamental therapeutic factor.

It is important to realize that the new mastery of an old unresolved conflict in the transference situation becomes possible not only because the intensity of the transference conflict is less than the original conflict—is only a "shadow play" of the original conflict—but also because the therapist assumes a different attitude from that which the parent assumed toward the child in the original conflict situation. The therapist's attitude is objective and understanding—that of a physician trying to help a patient. He does not react to the patient's aggression by retaliation or reproach, neither does he gratify the patient's infantile claims for help. In this objective atmosphere of positive helpful interest, the patient not only becomes capable of expressing his original tendencies more frankly but can also recognize that his reactions are out of date and no longer adequate responses to his present life situation. Once they were in a sense adequate reactions—the reactions of the immature child to existing parental attitudes. In other words, while the patient continues to act according to out-dated earlier patterns, the therapist's reaction strictly conforms to the actual therapeutic situation. This makes the patient's transference behavior a one-sided shadow boxing and this gives the therapist unique opportunity not only to have the patient see intellectually, but also to *make the patient feel* the irrationality of his emotional reactions. At the same time, the therapist's understanding attitude not only allows the patient to deal differently with his emotional reactions, but makes such a new settlement necessary. The old pattern was not formed in a vacuum—it was the result of the emotional interrelationship between parent and child. In fact, it was an attempt of adaptation on the part of the child to parental behavior. When one link in this inter-personal relationship is changed—namely the parental response—the patient's reaction becomes senseless. In the customary formulation of the dynamics of the treatment, the repetition of the old conflict in the transference was stressed and the similarity of the old conflict-situation and the transference situation emphasized. And yet in the difference between the original pathogenic and the therapeutic situations lies the value of the analytical procedure. One must bear in mind that the neurotic patient's attitude is not completely dominated by his neurotic patterns. His attitude towards the therapist is a mixture of

adequate reasonable reactions and preformed rigid neurotic behavior patterns. The free permissive atmosphere of the therapeutic situation—and primarily the fact that the patient comes for help to a person who does not judge him—encourages the unchecked expression of neurotic attitudes—in place of the early dependent tendencies. Their frustration—since the analyst does not assume the protective parental attitude which the patient unconsciously seeks—provokes aggressive feelings similar to those the patient felt towards his parents when his unlimited demands were not fulfilled. Dependence mixed with resentment, because the therapist does not gratify these dependent wishes to the extent the patient desires, is the most common emotional ground pattern upon which the individual variations of transference reactions are superimposed. At the same time, the patient, like every neurotic, also has reasonable adult attitudes. This dividedness in his personality is responsible for what one calls the neurotic conflict. His reasonable realistic attitude brought him to the therapist and makes him an ally of the therapist with whom he tries to master his irrational neurotic reactions. And just because the therapist never abandons the realistic therapeutic attitude, the patient's neurotic behavior becomes pointless and one-sided and brings the irrationality of the neurotic patterns into sharp relief.

It is needless to say that if the therapist has the opportunity to advise the relevant members of the patient's environment and instruct them what attitudes to avoid in relation to the patient, the effectiveness of the therapy can be greatly increased. Here again one should remember that the therapeutic interviews are not the only medium in which the correction of the patient's neurotic reactions takes place. If the patient's environment following the therapist's instructions no longer responds to his neurotic patterns in the usual way, the neurotic behavior loses its sense. Now, not only in the transference but also at home or in the office, the neurotic behavior pattern fails to fulfill its unconscious purpose and becomes pointless. Unfortunately, in most cases the therapist does not have such a consistent cooperation on the part of all the persons who play an important rôle in the patient's life. In the case of neurotic adolescents, parental cooperation, however, is not unusual and often of decisive significance for therapeutic success.

There is not sufficient time to illustrate the principle of corrective emotional experience by examples. In a forthcoming publication of the Institute for Psychoanalysis of Chicago, its significance will be demonstrated in great detail. The essence of

this principle is that the more precisely the therapist is able to revive the original emotional situation in the transference, and the more precisely he can provide by his own attitude towards the patient the necessary corrective experiences, the more profound and speedy will be the therapeutic result. The completely neutral psychoanalyst, who is nothing but a blank screen, does not exist in reality and would not even be desirable if it were possible. A basically helpful therapeutic attitude is, of course, a necessary prerequisite. However, it gives opportunity to the therapist for a great variety of responses. The intimidating influence of a tyrannical father can frequently be corrected in a relatively short time by the consistently permissive and pronounced encouraging attitude of the therapist but only after the patient has transferred to the therapist his typical emotional reactions originally directed towards the father. In a series of Institute cases, one of our staff members had an unexpectedly speedy and lasting result with a series of severely inhibited young girls by supplanting the strict super ego standards of the mother by a more liberal attitude. The important therapeutic factor was that the patients convinced themselves through actual experiences that attitudes and behavior which primarily were censored by the mother were not condemned by the therapist. Thus the original intimidating influences were corrected. The inhibiting effect of guilt feelings which had developed under the influence of overly indulgent parents towards whom the child had intensive hostile impulses can often be corrected within a comparatively brief period of treatment if the therapist assumes an opposite attitude to that of the parent, namely in such a case a just, but strict and non-indulgent attitude. While this sounds simple, in reality it requires a precise reconstruction of the original pathogenic interpersonal relationship. The therapist's responses must be calculated in all details and carried out with great consistency. Only thus can the required corrective emotional experience be provided. Only if he knows the emotional setting in which the neurotic patterns originated can he provide by his own attitude the desired corrective experiences. Most important in this connection is the fact that spontaneous reactions to the patient's emotional patterns are usually just the opposite of those which are desirable since the original parental reactions were not scientifically calculated but were natural responses of an exasperated, impatient, or over-solicitous parent to the child. To an arrogant, overbearing patient, the spontaneous reaction certainly would not be

deference, and yet when the patient's arrogance is a defense against his deep-seated intimidation, such a tolerant reaction on the part of the therapist might be the secret of success.

By using this technique in the case of a 41-year-old patient, whose aggressive, arrogant behavior not only completely isolated him socially but broke up his marriage, in six weeks of treatment consisting of two weekly interviews, profound change of behavior was effected, conversion symptoms of sixteen years' duration were relieved and his potency restored. The patient's whole early life was under the shadow of a domineering father who completely undermined the patient's self-confidence and drove him into an unsolvable, ambivalence conflict. The patient's unconscious tendency was to transfer to me his old conflict by pushing me into the rôle of the tyrannical father against whom he could rebel without any sense of guilt. His behavior was arrogant and provocative. I consistently counter-acted this tendency and leaned over backwards not to accept the rôle into which he tried to inveigle me. Instead of giving the appearance of conducting the treatment with firmness, I was careful not to become arbitrary in any respect. I let him choose the frequency of the interviews, allowed him each time to lie down, sit down, walk around, or smoke during the hours as he wished. I emphasized constantly the limitations of our field and of my own knowledge, made extremely tentative suggestions and interpretations, encouraged him to express his disagreements with me and to accept only what was in accord with his own judgment. It was of particular importance that I assumed an extremely tolerant attitude about everything including sexual matters which he repeatedly brought up in the course of his associations. It turned out that his father, who was dogmatic and strait-laced, had a very intimidating influence upon the son in regard to any sexual expression. I assumed the opposite attitude. While his father had been extremely critical, I gave open signs of my admiration of certain of his qualities such as his quick mind, his worldliness and his physical skills. I also expressed interest in his work and I let him explain details of his trade, asking questions and giving him the opportunity to explain things to me and he often did this in a distinctly didactic fashion.

It was fascinating to observe the patient's confusion in the face of such behavior. What he had learned was how to deal with a tyrannical father. His neurosis in a sense was an attempt at adaptation to the home atmosphere. One could see that

although he was not altogether satisfied with the lack of strict guidance on my part, yet he began to thrive under the influence of my permissive and encouraging treatment. I cannot go into further details, but the course of this brief treatment can be characterized as a progressive emancipation from the protracted effects of paternal intimidation.

The psychodynamic factors which brought about these rapid therapeutic results are considerably transparent. The main factor was that the patient in his relationship to the analyst was given the opportunity first to develop the same emotional conflict he had towards his father (transference neurosis), and second, to find a new, less neurotic solution of this conflict. The fact that the analyst's attitude was directly opposite to his father's attitude not only made the new solution possible but also made it necessary since the patient's habitual reaction did not fit the therapist's attitude at all. The patient's attitude was in a sense similar to that of an intimidated animal; a combination of rebellion and fearful grudging submission. His impotence was the expression of his adolescent insecurity since sexuality was still linked in his mind with paternal veto. The therapist, whom he immediately installed as a father image, consistently refused this rôle and treated him as an equal and thus made rebellion pointless and fearful submission impossible. The patient had gradually to accept the rôle of an independent adult into which he grew with amazing rapidity.

From all this it is clear that the intellectual reconstruction of the past is more important for the therapist than for the patient for whom it has only an accessory therapeutic significance. The emphasis upon the corrective emotional experience as the essence of dynamic psychotherapy brings the emotional aspects of the treatment into the foreground and the intellectual reconstruction of the past becomes subordinated to this fundamental therapeutic factor. This is the consistent and logical conclusion of a trend which has gradually more and more influenced psychoanalytic therapy and which began with the discovery by Freud of the transference as the dynamic agent of the curative

process. All etiologically oriented, prolonged forms of psychotherapy, whether they take place in daily interviews over a period of years or weekly interviews over two or three months, consist essentially in an emotional training by giving the Ego opportunity to face again and again, in smaller or larger doses, formerly unbearable emotional situations and to deal with them in a different manner than in the past.

However, this can be only learned by actual experience. Intellectual insight alone is not sufficient. This corrective emotional experience is the common basis of all etiologically orientated psychotherapy. Limitation of time does not allow detailed discussion of the other therapeutic factors which are subordinated to this fundamental one. It should not be forgotten that while the patient is in treatment, he has also emotional experiences in his daily life which may have a significant influence upon him. The corrective emotional experiences in the transference situation enable the patient to undergo life experiences which he was unable before and which reinforce the therapeutic influence of the treatment situation. In certain phases of the treatment, it is desirable to have the patient translate into his actual life experiences his newly acquired reaction patterns without having the support of the analyst. In this phase, shorter or longer interruptions are indicated. A proper coordination of life and therapeutic experiences is the basis of changing the frequency of the interviews and of interruptions.

The re-experiencing of the unsettled old conflict but now with a new ending is the secret of every penetrating therapeutic result. Only the actual experiencing of a new solution in the transference or in life situations gives the patient the conviction that a new solution *is* possible and induces him to give up the old neurotic pattern.

By repeating them in life and in the therapeutic situation, these new corrected emotional reactions become gradually automatic, which amounts to the development of new integrative patterns in the Ego. In this way the therapeutic results become consolidated.

Narcotherapy *

PAUL HOCH, M.D.

The use of sodium amytal in conjunction with psychotherapy has shown its value in dealing with cases of war neuroses. It also has its place in treatment of the civilian neuroses. Sodium amytal is used in diagnostic and therapeutic work.

The *diagnosis* of a neurosis is easier with sodium amytal than without it. Under the influence of the drug, the patient is in a state of relaxation: inhibitions are lowered; the ability to speak is fostered; the establishment of a transference is expedited; resistance is more quickly overcome. The ability of the patient to cooperate may be quickly determined. Focal points of attack on the neurosis will reveal themselves more quickly. The structure of the neurosis, if not too deep-seated, can be reconstructed in a few sessions, and a decision can quickly be reached as to whether the neurosis is too deep-seated to be amenable to short-term therapy.

The *therapeutic* aspect: Sodium amytal produces in the patient *first*, euphoria; *second*, it breaks down inhibitory mechanisms and therefore rapid transference is established; *third*, the drug puts the patient in a suggestible frame of mind; *fourth*, it demonstrates to the patient the ability of the physician to control organic dysfunctions by relaxing the patient, eliminating the conversion manifestations of anxiety, and frees the patient from the bombardment of sensory perceptions. The therapist therefore makes the patient free to concentrate on the treatment without giving an excuse to dwell on the symptoms. *Fifth*, it has a strong appeal to the patient because it uses physical means of approach which the patient generally accepts more readily, based on his preconceived idea of a physician. In addition, the patient feels less isolated with his disorder because the treatments are partly medical,

and thus does not feel set apart in having an emotional instead of a physical disorder.

This treatment is superior to hypnosis because in most patients a state of relaxation and suggestibility can be obtained while hypnosis fails in many instances, especially with overanxious patients. It has, furthermore, a great advantage in that the patient does not give up the symptoms on a command, but by a combination of suggestive and explorative procedures gains some insight into the dynamics of the neurosis, which has more prophylactic value than a simple command hypnosis.

We have little information as yet about the disadvantages of this form of therapy. We are sure that it will fail in many cases where the neurosis is quite ingrained. However, in such cases even a very prolonged analytical treatment may fail. Only extensive research will establish the criteria for one treatment or another, or will be able to demonstrate how many more patients are cured with the prolonged form of treatment as compared with shorter techniques. We believe that failure with short-term treatment does not effect extensive damage because prolonged analytical treatment may always be instituted if the short type of treatment fails.

Another danger of the treatment may be the patient's addiction to it. The relaxing effect of the barbiturate on tense, anxious individuals is great, and it is possible that some of them would crave the treatment more for the drug than for the psychological help which is offered with it. Alcoholics and drug addicts are not suitable individuals for this type of treatment nor are persons who are addicted to sleeping medicines.

Until now we have not seen any development of addiction in our patients. The sodium amytal treatment is especially helpful in acute anxiety states, conversion hysterias and in psychosomatic conditions. In obsessive compulsive cases or in neuroses with overt symptomatology of long-standing, the results are less satisfactory.

*This and the following three papers are abstracts of papers delivered at the New York Regional Meeting of the American Society for Research in Psychosomatic Problems, May 11, 1945.

Hypnotherapy *

MARGARET BRENMAN, Ph.D., AND MERTON M. GILL, M.D.

For many years an interest in hypnosis as a tool of psychotherapy has flickered up with isolated reports of dramatic cures and then died down again. The search for briefer methods of psychotherapy as well as for auxiliaries to extended psychotherapy makes it seem likely that the present wave of interest will be more sustained and will lead to a more complete and systematic exploration of the nature of hypnosis and the ways in which it may be utilized in treatment.

We shall discuss briefly the question of hypnotizability, methods of inducing hypnosis, and the relationship between the degree of hypnotizability and therapeutic success. The remainder of our presentation will be devoted to a description of some of the ways hypnosis can be used as a tool of psychotherapy—and to a discussion of the hazards one may encounter.

First, on the question of who can be hypnotized: we have thus far been unable to conclude either from the literature or from our own experiences that any particular psychiatric syndrome has a monopoly on easily hypnotized subjects.

Regarding the second practical problem of the most effective way of inducing hypnosis: we have found that the time-honored standard method of monotonously repeating to the patient that he is relaxing and going to sleep will succeed only with the easily hypnotizable, and that the nuances of procedure to be introduced to fit the immediate needs of a particular patient have been very incompletely verbalized in the literature.

It has been frequently observed by workers in the field that there seems to be no reliable correlation between the depth of hypnosis obtainable in a patient and the therapeutic result. At first glance this is extremely puzzling inasmuch as the natural supposition would be that the deeper the hypnosis the better the chances of cure. In line with a suggestion made some years ago by Schilder, some of our recent experiences have shown us that another factor which seems as important as the depth of hypnosis judged by standard criteria plays a significant role in determining the therapeutic response. This second factor may be thought of roughly as the extent to which the patient permits himself deep

emotional participation (whether consciously or unconsciously) in his hypnotic experiences. Thus, a patient who is in a "light hypnosis" may become far more deeply involved in the procedure than one who is in a deep hypnosis. (Two case illustrations are given here.)

Classical technique of using hypnosis as a medium for commanding the disappearance of symptoms is now rarely employed. Two of the more modern uses are as follows: a therapist may use hypnosis simply to establish initial rapport with a previously inaccessible patient; he may employ it to alleviate symptoms which make non-hypnotic psychotherapy impossible, or he may use it to accelerate psychoanalytic treatment in certain cases. (Case illustrations are offered.)

Regarding the dangers of hypnotherapy we must say first that they have usually been much exaggerated. For example, the belief that hypnotherapy results in overdependence on the therapist is no more true here than in any other form of psychotherapy, nor is it true that patients become "addicted" to hypnosis and rely on it as one would on a drug. On the whole, investigations of supposed "injuries due to hypnosis" have revealed far more smoke than fire. However, we feel it is important to state certain cautions which issue from our experience. We have found, for example, that a patient may utilize being in hypnosis as an emotional indulgence and unconsciously block the therapy; also that the existence of strong paranoid trends is a contra-indication.

We have tried to show in this paper that the present revival of interest in hypnosis as a psychotherapeutic agent occurs at a time when there exists an urgent need for increasing the number and efficiency of the available techniques, and when the possibility for integrating it within our modern theories of personality is greater than ever before. We have touched on a few of the problems which require further investigation and have shown that modern applications of hypnosis have progressed far beyond the attempt to command symptom disappearance. Although these new approaches require far more exploration before a set of general principles can be stated, it is our belief that such systematization achieved through careful research will delineate the potentialities of hypnosis as a therapeutic agent.

* From the Menninger Foundation, under a grant from the Josiah Macy, Jr. Foundation.

Group Psychotherapy

ROBERT G. HEATH, M.D.

The type of group therapy to be described was used in the treatment of Merchant Seamen in the nearly ideal environment at the Sands Point Rest Center in conjunction with other techniques of brief psychotherapy, narcoanalysis, hypnosis and sedation.

Patients were divided into three groups for homogeneity:

- A. Alcoholics.
- B. Those who had made fairly adequate adjustments before experiencing combat.
- C. Psychoneurotics who saw no combat or in whom the combat experiences were but a minor factor.

The number of men in a group varied between 5 and 20. Entrance into the group was gradual. There was no time limit and sessions usually lasted one to two hours. Informality prevailed.

PROCEDURE OF THE MEETINGS

In the alcoholic group, therapy was superficial, and closely resembled the Alcoholics Anonymous meetings. After discharge they joined Alcoholics Anonymous. Therapy was directed toward restoring self-esteem, badly shattered by repeated sprees, and redirecting the infantile desire for omnipotence. Also, this group took care of the alcoholic's need to be dependent. This therapy does not teach the basic pathology, but is good palliative treatment. The men must attend meetings regularly to stay dry.

Until recently most admissions fell into the com-

bat group. Here I acted as leader; discussions were superficial, and aimed at restoring damaged ego and releasing pent-up aggressions. At the beginning of each meeting, reasons for having group therapy were explained in such a way as to help restore the damaged ego. Every effort was made to remove the stigma of being neurotic. It was emphasized that the prognosis was good. The meeting developed without a pre-arranged text, and the discussion came almost entirely from the group. The therapist when called on to give explanations did so in such a way as to encourage further release from the group. In explaining the physical fear, the normalcy of the reactions was always stressed as an aim in restoring ego and lessening guilt. This therapy aids in the adjustment of only those who were fairly well before seeing action. It releases little if any unconscious material.

In the psychoneurotic group, the advantages of group therapy as described for the combat group were utilized in conjunction with individual therapy to effect a release of deeper unconscious material. The leader was one of the patients and I, as doctor, sat in the background. The first speakers were men who were making progress and they went into their problems in detail. This set the ball rolling and others then spontaneously availed themselves of the opportunity to unburden themselves. I did not interpret in the groups. When a man met a resistance which could not be broken in the group he was worked with individually. Hypnosis and narcoanalysis were used when indicated. Usually he was then able to make further progress in the group.

Group Psychotherapy with Veterans

NATHAN W. ACKERMAN, M.D.

Group psychotherapy was employed at the Red Cross Rehabilitation Clinic for War Veterans on the principle that the social and psychological problems of demobilized veterans have certain common features. Before admission into the group, each man was examined medically and psychologically. Where indicated, the psychiatric examination was supplemented with psychometric and Rorschach tests. An effort was made to select for group treatment, as far as possible, the more acute disturbances

in which social maladaptation was a prominent feature. The clinical categories into which these men fit were the following:

(1) Adult maladjustment; (2) character disorder; (3) combat neurosis; (4) psychosomatic disorders with such symptoms as headache, insomnia and fatigue. The dynamic composition of the group was balanced by including some aggressive and some timid personalities. While these personalities displayed many individual differences, there was

sufficient basic similarity for a direct therapeutic approach to certain common conflicts.

The therapeutic aims were concretely the following: (1) To provide emotional support through the group relationships. (2) To activate emotional release of specific anxiety-ridden conflicts; in particular, to encourage the discharge of pent-up aggression. To accomplish this, group psychological forces were exploited selectively to reinforce some emotional trends and to dilute others. (3) To reduce guilt and anxiety. (4) To provide opportunity for the testing of various forms of interpersonal reality as dramatized in the group relationships, and thus encourage the correction of irrational interpersonal reactions. (5) To provide opportunity for the modification of the concept of self in the direction of increased self-esteem and the recognition of constructive capacities. This in turn tended to increase the acceptance of other persons, and tolerance for frustrating experience. (6) To foster the development of insight arising from an actual living out of emotional drives in the context of multiple social relationships. The technique of interpretation was employed only when the expression of specific emotional trends was sufficiently solidified.

The group experience was a significant source of emotional support for these patients. It stimulated a sense of belonging which tended to counteract their emotional and social isolation. The patients felt an increasing security in the release of their pent-up emotions, and used the group as a sounding board for their conflicts and fears, thus discovering their real meaning. They tended to reduce their respective problems to the level of a common psychological difficulty, which in turn enhanced the emotional unity of the group. The patients identified with each other and with the therapist, which offered an extensive opportunity for sharing many varieties of emotional suffering. The interpersonal patterns were characterized by

mutual protection, strong bonds of loyalty and, at other times, by sharp competition and free expression of hostility.

The therapist was an active participant in the group experience, but played a special role. He personified the aim and activity of the group, and represented authority. The therapist assumed responsibility for balancing the interpersonal "give and take," in particular, for regulating aggression in the interest of preserving group unity and safeguarding the therapeutic process. He catalyzed the release of repressed feelings and established an atmosphere in which defenses and rationalizations could be removed so as to lay bare the underlying conflict patterns and anxiety reactions. He channelized the expression of these basic drives toward a more accurate understanding of the patients' problems.

The method is still in the exploratory stage and no definite statement as to its value can yet be made, but the experience seems to indicate that the group method offers a means for therapeutic resolution of some types of social maladaptation and emotional disturbances of relatively recent origin. Within certain limits, it is also a suitable instrument for modifying socially inefficient defense patterns, and for the analysis of maladapted character traits.

Group therapy is a more real experience than individual therapy. It is less bound to the irrationalities of the unconscious, and is weighted on the side of allegiance to social reality. Its therapeutic powers are sharply limited for chronic, rigid personality distortions with deep, unconscious roots. Its greatest effectiveness seems to be in the area of re-integration of ego patterns with resulting improvement of social adaptation. It should be stressed that group therapy is an independent method serving special purposes. It is not a substitute for individual psychotherapy, and is not in competition with it. For certain patients it may be usefully combined with individual psychotherapy.

ANNUAL MEETING

HOTEL PENNSYLVANIA

NEW YORK

May 11th

9:00 a.m.

Registration

9:30 a.m.

CONTRIBUTIONS OF MILITARY MEDICINE TO PSYCHOSOMATIC MEDICINE

Chairman, Roy G. Hoskins, M.D.

PSYCHOSOMATIC MEDICINE: SOMATIZATION REACTIONS

William C. Menninger, Brigadier General, M.C., U.S.A.

BRIEF PSYCHOTHERAPY IN PSYCHOSOMATIC PROBLEMS

Roy R. Grinker, M.D.

'ILL-HEALTH' AS AN EXPRESSION OF ANXIETY IN A COMBAT UNIT

M. Ralph Kaufman, M.D.

Discussants: Howard Rusk, M.D.

Leon Saul, M.D.

Edward Weiss, M.D.

2:30 p.m.

PSYCHOSOMATIC ASPECTS OF ORTHOPEDIC PRACTICE

Chairman, Carl A. L. Binger, M.D.

LOWER BACK PAINS

Henry Jordan, M.D.

CAMPTOCORNIA OR THE FUNCTIONAL BENT BACK

Samuel A. Sandler, M.D.

PHANTOM LIMB

Jack R. Ewalt, M.D. and Guy Randall, Lt. Col., M.C., U.S.A.

Discussants: W. Edward Chamberlain, M.D.

Leo Davidoff, M.D.

Raymond Squier, M.D.

Gustav Vychonski, M.D.

ANNUAL DINNER

6:30 p.m.

Chairman, Roy G. Hoskins, M.D.

NEW ADVANCES IN PSYCHOSOMATIC INVESTIGATIVE TECHNIQUES

(An Illustrative Parody)

Bertram D. Lewin, M.D.

THE EPIC OF BELAWOLFF OR THE SLAYING OF THE PSYCHO-SOME

Carl A. L. Binger, M.D.

May 12th

9:30 a.m.

Business Meeting

Chairman, Roy G. Hoskins, M.D.

10:00 a.m.

Chairman, John C. Whitehorn, M.D.

Submitted Papers

Registration fee for non-members is \$5.00 for two days; \$3.00 for one. The charge for the Annual Dinner is \$5.00. Limited hotel reservations are available until April 27.

REVIEWS, ABSTRACTS, NOTES AND CORRESPONDENCE

THE WAR BLINDED

THEIR EMOTIONAL, SOCIAL AND OCCUPATIONAL SITUATION

MAJOR E. WITTKOWER, R.A.M.C., AND R. C. DAVENPORT, F.R.C.S.*

I. INTRODUCTION

In continuance of previous similar studies in the limless and in monocular personnel, the following report, made jointly by a psychiatrist and an ophthalmologist, concerns itself with the state of mind of the blinded. It tries to outline the numerous subjective and objective difficulties with which the blinded ex-serviceman is confronted. Its immediate object is to help the war blinded and those in charge of them. Beyond this it is hoped that it will throw into relief problems which exist in similar form in other war disabled. Rehabilitation of temporarily or permanently disabled personnel can only be successful if regard is given not only to the men's physical readaptation, but also full cognisance is taken of their emotional state, their employment situation and their integration within their small group and within the community at large.

nearly 3,000 war blinded individuals, and a world wide organization has been built up which not only made the lives of many men and women, but has by its activities and advices, enormously advanced the cause and welfare of the blind everywhere. Its experience and experiments have produced activities and apparatus of great value. In this war during which many hundreds have come into its care in Great Britain and overseas, it has operated a hospital for service cases with grave eye injury and this has brought men and women into its special atmosphere in the earliest stages of their blinding.

II. MATERIAL AND PROCEDURE

Biographical studies extending over at least three hours for each subject were made in an unselected sample of 103 blinded persons. The sample was composed as shown in Table I.

TABLE I

1. Sex	99 men; 4 women.
2. Age varying from 19 to 49	5 men blinded during the previous war, aged 43-56.
3. Marital status (prior to blindness)	47 married; 56 single.
4. Arm of service	Army 83 (1 member of the A.T.S.); Navy 6; Airforce 8; Civilians 6 (including 3 women).
5. Rank	6 Officers; 27 N.C.O.'s; 64 Privates or equivalent.
6. Type of enlistment	16 members of the Regular Forces; 22 Territorials; 23 Volunteers; 36 Conscripts.
7. Visual defect	73 totally blind; 30 semi-sighted but within the blind standards.
8. Cause of visual defect	96 injury; 7 disease.
9. Attributability	Blindness attributable to enemy action 48 Blindness not attributable to enemy action 55
(The high percentage of cases not attributable to enemy action is explained by the fact that military activities had not then opened in Western Europe and that battle casualties from fighting in the Middle East came back from this area as and when transport permitted.)	
10. Duration of disability	17 were seen within 6 months after blindness. 50 were seen between 7-24 months after blindness. 30 were seen 25 months or more after blindness. 6 were seen 20 years or more after blindness (including 5 previous war cases).

With the exception of a few cases in the factory group, all the blinded studied were, or had been, at St. Dunstan's.

Founded early in the last war by Sir Arthur Pearson, St. Dunstan's trained and looked after

* Medical Commandant and Ophthalmic Surgeon to St. Dunstan's.

Verbatim notes of every interview and a detailed report on every patient were kept. Special attention was paid to the type of reaction displayed and the factors determining it. Valuable additional information was obtained by conversation with the staff and with wives of some blinded ex-servicemen.

III. EARLY STAGES

(a) *The experience of being blinded*

Few soldiers lose consciousness immediately on being blinded. They may see the flash of the shell that blinds them and then everything is plunged into darkness. Instinctively they put their hands to their eyes for protection and then shout for help or crawl some distance. Occasionally they feel soft tissues from the eyes hanging down the face but frequently they are unaware of the seriousness and permanency of their disability. Some joke about their misfortune or curse at the enemy believing that their sight has been obscured only temporarily. More often, however, blinded soldiers assume momentarily that they will be blinded and helpless for life. Rather than be a burden to their families they may expose themselves to enemy fire. Their only wish is to die.

Shock and loss of blood subsequently dims consciousness and they often only vaguely remember the various stages of their journey from the battlefield to the Base Hospital.

(b) *In Hospital*

Even the keenest soldiers may heave a sigh of relief on arrival at the Base Hospital. "Thank God I am out of it," they say to themselves and relax in the quiet surroundings of the hospital ward after the din of battle. For some days they simply doze or sleep if pain allows them to sleep; their sleep is often disturbed by battle dreams. If they think at all, their minds are still at their units.

Only gradually as they recover, the seriousness of their condition dawns upon them and doubts creep into their minds as to whether their blindness will be permanent or temporary. They have plenty of confidence in the skill of ophthalmic surgeons and, with both eyes bandaged, they fail to realize—sometimes for weeks—that their eyes have been damaged beyond repair or even completely destroyed. Sooner or later they will ask about their sight. Their Medical Officers and ward sisters, partly because of lack of knowledge and partly because of kindness of heart, are apt to be evasive or to raise unfounded hopes. But even for the ophthalmic surgeon it may be difficult or impossible to make a decision or to give a firm answer at an early stage, and pressure of work for a man often on a consultation tour may prompt him to take the easy line of evasion or of saying nothing, leaving it to the ward sister or to the padre to make the best of a harassing job demanding time and care.

As they begin to realise that they may be blinded

for life, most patients give way to despondency. Some men have a good cry. "What will the future bring without my eyes?" All that is beautiful to look at will be cut out. As a participant or as a spectator, sport will have come to an end. Most of them visualize with gloom a bleak future of helplessness and of dependence. They believe that they will be a burden to their families, incapable of looking after themselves, of carrying on with their old trade, or even of earning a living. Some of them think that they may be locked up in an institution for life. If they are married, they wonder how their wives will take it—"will she think the same of me?"; if they are single, they believe that no girl will care for them. No one will bother with them, so they believe, or people may even turn against them.

A fair number of men refuse to accept the finality of their fate and keep on hoping. Others accept it implicitly and start to rearrange their lives accordingly. Some men, to the complete exclusion of their own condition, show great concern about comparatively trivial matters; others comfort themselves by the thought that it could have been worse.

Gradually they settle down to hospital routine. A visit by their Regimental Officer and by some of their pals cheers them up a good deal. After all they have not been forgotten. The padre or the ward sister has written to the family thus relieving some of their anxiety. Sighted patients in the ward talk and read to them. Little by little their spirits rise and one day they catch themselves joining in the ward fun.

The news that they will be sent to St. Dunstan's is received with mixed feelings. For some of them it means, erroneously, that the verdict of permanent blindness has been passed; for others that there is a chance of becoming self-supporting despite blindness.

(c) *At St. Dunstan's*

On admission to the hospital unit of St. Dunstan's, most men are anxious to contact their families with whom they have not been since their return from overseas. Although they are glad to meet them, they dread the moment of their first reunion. "How will they be received?" "Is blindness really their fate?" They put off telling their people and even try to fox them while they are on leave.

Most men are in a state of some helplessness when they arrive at St. Dunstan's. Many have multiple injuries. Those in whom the initial shock has not yet abated are in need of rest and sometimes sleep for 24 hours; others are restless, fidgety

pendency. Disturbing battle dreams still frequently persist. While in bed they like to have attention even if their eyes or sockets require little. To lie in bed with nothing to see is boring. They therefore like a chat, and the wireless and the talking book are great standbys. Stringbag making, weaving and other forms of occupational therapy are very popular.

They have to learn to feed, wash, bath, shave and dress themselves. To lay their things out properly is essential for blind men. On feeding, they use a spoon to begin with but they are encouraged to use knives and forks as soon as possible. Meat has to be cut for them and fishbones have to be taken out. They learn to cut the meat within three months. Blind men like to be told what dishes they get. For many, with nothing much to do, food becomes a main interest; some are finicky and a few allege without justification that better food is served to others.

Their first attempts at walking are, of necessity, clumsy, and a few bumps and bruises are almost inevitable. Obstacles in their way such as chairs or pillars, are useful because they help the blind men to take their bearings. For this reason pieces of furniture are always left in the same positions. A blind man may take his course, for instance, midway between a chair and the sound of the wireless. Gradually the blind man makes his first steps out of doors often waving furiously with his stick.

The blind man receives a Braille watch immediately on arrival at St. Dunstan's and his first lessons are in Typing, and Braille (Reading and Writing). On transfer to the Training Institution after invaliding from the service more advanced work is begun. After initial exercises planned to develop sensitiveness of touch and manual skill such as woodwork, wool rugs, basket-making, and Meccano, the men are trained for such occupations as masseurs, upholsterers, telephonists, boot repairers, capstan lathe operators, router operators and work on inspection or assembly.

The majority take up dancing as a recreation and many other entertainments such as variety shows, cinema shows, walks, card playing with Braille cards, and dominoes, are offered to them. They soon learn to follow the spoken word of a film with a few explanations from an escort. A number take up the playing of a musical instrument.

Sport facilities are available within the limitations of the blind—e.g., tandem cycling, goal-kicking, throwing a cricket ball or discus, putting the weight, running (using a bell to give direction), swimming, and rowing. The blinded soldier

thus acquires a certain sense of independence, although obviously severe handicaps remain. The greatest difficulties are: inability to see those they are with or to watch their facial expressions; to find their way about in a strange place; to cross roads on which there is much traffic; to take a full part in sport. Moreover, until they have learned typing they have to dictate their private letters and, unless their correspondent is a Brailist, their incoming letters must be read to them and blind men find this lack of privacy a problem to which it is very hard to adjust themselves.

IV. GENERAL EFFECTS OF BLINDNESS

(a) Blindness compels an individual to rely on his remaining sensory organs. This results in an altered orientation of perception with emphasis on touch, hearing and smell. Whether this is due to an actual lowering of the perceptory threshold or, more likely, to a mere shifting and focussing of attention, requires further investigation.

(b) Observation of blind men in their daily routine makes it obvious that some of them make predominant use of hearing and others of touch. The defiant type of man ventures out on his own after a few days in hospital, whereas the anxious individual clings to the wire or insists on being escorted for a long time. Preference for touch or hearing, if continued after the initial stages, may be related to previous types of imagery. Men with hearing defects are compelled to rely on touch.

(c) Ways and means of getting about vary and are usually complex. Blind men follow the kerb of a road. They take notice of changes in the texture and in the level of the surface of the road. They orientate themselves with the aid of landmarks. They pace out the distance from a particular landmark to their place of destination. Air currents indicate that they have reached a street turning. The hollow sound of their footsteps tells them that they are under a bridge; alterations in the echo also point towards the presence of a building, of a lamp post or of a tree. Open spaces baffle a blind man, snow obliterates his landmarks and high winds interfere with his hearing. Well meant interference by sighted people may put him off his direction.

(d) After some time blind men develop a sense of obstacles. About two or three yards before they come up against them, even the totally blind, experience a sensation of what they describe as a black cloud passing across their minds. They then slow up and put out their hands. According to most of them the obstacle must be at least waist

high to be sensed. Some men allege that they can differentiate between a hedge, a standing car and a gate, from a distance. Ruling out the possibility of extra-sensory perception, the phenomenon could be described as a translation of non-visual experiences into familiar visual experiences.

(e) Blind men do not live in a world of pitch darkness, they continually try to picture in their "mind's eye," what they are passing, such as birds and trees. "I sometimes forget that I am blind," several of them said. In fact, their inability to see is made up to a great extent by their remarkable ability to visualize for instance, in learning anatomy. Familiar faces can usually be easily visualized though perpetuated as seen previous to blindness. People never grow older in the fantasy of the blind. Strangers are visualized by their voices. Their faces are often a blur, or are assumed to resemble known persons with similar voices. If they like the person's voice, they may endow her with the features of a beautiful film star; if not, the individual may appear to them as a hideous rogue. Once formed, the mental picture of a person sticks, even if corrected. Height can be guessed from the direction and age from the tone of the voice. One man had the habit of lifting up people to get some idea about their stature. Others run their hands over a person's face; one of them in this way, discovered with delight dimples in his fiancée's face after two years of engagement. A few of the men had a stereotype setting for all their mental pictures, e.g., a factory always in the background or the face of a pretty girl in one corner, "like on a picture postcard."

(f) In their early stages of Braille reading, a majority of the men visualize in their minds, the pattern of the dots, some ordinary letters. Afterwards Braille reading becomes automatic. Most men on reading Braille bend their head down as if they could see. During the first few weeks commonly, but sometimes many years afterwards, blind men complained of "eye-ache" after prolonged Braille reading even if they had lost both their eyes. This may be due to fatigue of the cerebral reading centre referred to the familiar localization of its experience.

(g) Blind men of necessity have to rely more on their memory than sighted persons. Hence many blind men reported that their memory had improved. With few exceptions they smoked heavily and a fair number drank heavily; a few had given up drinking since they were blinded.

V. SOME COMMON PSYCHOLOGICAL FEATURES

(a) *Desire for independence*

Blindness at first makes a man very dependent on other people. Right from the start the aim of the St. Dunstan's training is directed towards convincing the blinded man that he can regain his independence and can become a self-supporting member of the community. This succeeds to an extent which is generally unknown. To some men blindness even acts as an incentive and they rise above themselves in their endeavour to overcome the obstacles placed in their way. Blind men take pride in what they can do despite their disability; they resent assistance if not absolutely required and object to pity by well-meaning, though ill-informed sighted persons.

(b) *Feelings of inferiority*

The immediate effect of blindness is to throw a self-reliant individual into a state of childlike helplessness. He has to learn to walk again without assistance. If his hands were blown off too, he has to be fed. He has "to go to school" again to learn to read and to write. For a considerable time he has to be supported by other people until he has acquired a new skill to earn his living. No wonder, therefore, that many blind men, in a depressive mood, consider themselves an encumbrance on their families and on the community at large. At St. Dunstan's, it is true, they have been made to feel at home, but in their home town it is different. There, people pass them in the street without talking to them and not infrequently, silence descends upon the happily conversing crowd, when, at a party, the blind man enters the room. Blind men cannot take part in various activities of the sighted such as sport, and they begin to wonder whether ever again they will be on equal terms with the sighted. But even if they have succeeded in firmly establishing themselves in well-paid positions, blind men often cannot rid themselves of the feeling that sighted people look down upon them and they are apt to react badly to situations which show up their disability.

(c) *Jealousy, suspicion, envy*

Feelings of inferiority in combination with imperfect grasp and assessment of prevailing circumstances give rise to suspicion. A blind man has plenty of time to think about what has been said to him and, if he is predisposed in this way, he

may read into remarks hidden meanings which were not intended. If a sighted person on reading out one of his letters, giggles because she has just seen something funny, he may immediately jump to the conclusion that the contents of the letter or his wife's faulty spelling were the cause of the merriment.

Blind men naturally need kindness more than the non-disabled, but are less disposed than the average to share it with others. Many of them, owing to their feelings of inferiority, are constantly on the lookout for rebuffs and find them where they do not exist. Complaints of favouritism are very common.

With and without spite, blind men envy sighted people. Moreover, the totally blind accuse the semi-sighted of showing off what they can do, and the semi-sighted accuse the totally blind of exploiting their disability to obtain extra attention.

(d) *Impatience, irritability*

The proverbial meekness of the blind is basically a myth. Their very disability makes for impatience. Sighted people do not like to be kept waiting; but for the blind, because they are unable to see what delays their attendants, it is all the more annoying. "Everybody seems so slow in grasping and doing things," they often say. They hate being led about and take it badly if their escorts are a few minutes late. They expect sighted people to keep their eyes open and, if their escorts, by chance, lead them into obstacles or if people thoughtlessly stand in their way, abuse may be forthcoming.

(e) *Sense of humour*

Jokes of blind men if related to their disability are either directed against themselves or are made at the expense of sighted people. Their little blunders, bumping into something or tipping something over, are a never ceasing source of amusement. Two blind men may be walking along the street and with a twinkle in the eye, one may say to the other: "A pretty girl over there, isn't she?" Or a blind man may talk jokingly about his Braille mirror. The story about the blind man who lifted up his son, upside down by mistake, caused uproarious laughter. Much play is made of such words as "see," "look" and "watch." If their jokes are directed against sighted people, they contain almost invariably strong elements of bitterness. A story is told about a blind man who went to a local bar and ordered a drink. "You are drunk," said the barmaid, "You can't have one." "I'm

drunk?" said the blind man, "certainly not." "I can see it in your eyes," says the barmaid; whereupon the blind man puts his artificial eyes on the bar. Bitterness may prevail to such an extent that the joke ceases to be funny. One day a blind man was reading Braille when two old folks entered the hut. Infuriated by their sympathy the blind man threw his Braille book on the floor saying: "I shall never learn this." The old people burst into tears. "Wasn't that funny?" the blind man asked the interviewer.

(f) *Sex life*

Staff and blinded men alike agree that at least during their period of training blind men are often unusually aggressive sexually. Their reliance on touch brings them into close physical contact with females and, after all, the sexual pleasure is one which, a willing partner provided, is not denied to them by their disability. Prior to their injury many of the blind men had been on service overseas for a long time and at the training centre they necessarily live largely separated from their wives and sweethearts with plenty of time at hand.

Many of the blind men stated that since their disablement they felt more at home in the company of women than in that of men in whose company they are too much reminded of what they have lost. Women, so they say, have more understanding for them and they also gratify their need for affection. Fear, however, that they receive sympathy or pity rather than the true affection which they want, is hard to dispel. Those especially who are severely disfigured are in serious doubt whether they are acceptable to women any longer and acknowledge any token of evidence that this is still the case. Deprived of many male prerogatives by their disability, they have an urge to prove themselves as strong he-men for their own sake and that of others. Hardly or only vaguely understanding their own motive, they often indulge in barrack-room boastfulness over their sexual adventures or drift into little affairs devoid of true and mature emotional ties.

The women, on the other hand, with whom they come into contact—apart from the trained staff—were originally prompted by pity in their desire to be kind to the blind man. As they meet him more often they gradually grow fond of him and, after a while, they do not know in their own minds how much is sympathy and how much affection, in their own feelings towards him. The blind man may take advantage of the changed situation and may ask for more.

(g) *Dreams*

Dreams mean much more to blind men than to sighted persons. For a while, if only in a dream, they can see again. Familiar faces are seen quite clearly, those of strangers as a blank, as a blur, or they "stick a face on." They experience their recovery with exultation and are downhearted when, as they awake, reality comes back to them. Some men know in their dreams that they are blind and yet they can see. In their dreams they try to convince others that the miracle has happened or feel a fraud because they are led about. Very few of them are blind in their dreams; one of them could see his empty sockets in a mirror.

In the early stages of their blindness they usually relive their battle experiences in their dreams and especially the occasion which brought on their injury; alternatively, they are involved in some catastrophe such as the end of the world, an earthquake, a railway crash or a fall over a precipice. As time goes on, nightmares recede and sometimes alternate with pleasant dreams. They dream of being back at home, at their workshop, at their unit or conjure up their newly-born baby which they have never seen. Disturbing dreams if they persist are of a different nature. Rather than victims, they are now spectators of unpleasant incidents happening to others which, from a secure spot, they watch with concern but also with gusto—a personal enemy driving into a telegraph pole, two Germans transfixing each other with their bayonets, etc.

Their dreams reflect their mental state as in the following abbreviated examples: "I dreamt of being in a dark forest and did not know which way to turn." "I walked along a rope and safely reached the other end." "I was standing on a rock. Youngsters tried to climb up but fell to death. I succeeded in reaching firm ground." "A little man was sitting on my shoulder and guided me round the streets. He took me to a tribe of them and I brought some of them to St. Dunstan's and I gave one to each of the blind men."

(h) *Nervousness*

Contrary to expectations, blind men speak very freely when interviewed. It happened not infrequently that after a few preliminary questions they got talking and were still going strong three hours afterwards. Darkness, in general, invites confidential talk which is facilitated by an inability to see the other person's facial expression. In addition blind men seem to be in need of relieving

their pent-up emotional tension. Their accounts were sometimes interspersed by fits of crying. Very understandably they are nervous of traffic. Because it is difficult for them to assess distance, they often anxiously cling to their escorts as a motor lorry rushes past. Like ostriches, they are apt to imagine that they may not be seen by others because they cannot see themselves. Feelings of helplessness as well as a shattered belief in their invulnerability, account for their unusual fear of air raids. They are often easily startled. Their sleeplessness is usually attributed to their inability to differentiate between light and darkness and to their lack of exercise. This explanation, however, is hardly satisfactory in view of their frequent disturbing dreams. Moreover darkness has not necessarily a soothing effect on everybody; it also revives childhood fears kept in check during bright daylight. Strange though it may appear, a fair number of blind men were found to be subject to a morbid fear of darkness. These men visualized the darkness around them very vividly and, fancying the presence of men ready to pounce at them, they ran as fast as they could for the shelter of a well-lit house.

Various forms of so-called psychosomatic disease are common, usually "gastric" (and ulceration is not uncommon), or "cardiac." While over-smoking and the common habit of bolting food may play a part in the gastric cases, symptoms commonly arise with nervous stress, e.g., anxiety over training, the faster progress of a friend, domestic worries or love affairs—in earlier days; fatigue, boredom, or anxiety—in later years of blindness. A fairly common condition is the late reaction well known to experienced St. Dunstan's Staff. The defiant, cheerful reaction of the man who has "taken it wonderfully" breaks down to some extent—he sleeps badly, gets indigestion or palpitations, loses interest in his training and work, the result of a change in the emotional reaction to his blindness.

VI. TYPES OF EMOTIONAL REACTION

Most of the men studied were seen at a time when they had passed beyond the early mood fluctuations and when the reaction to their blindness had assumed a fairly stable pattern; but even at this stage, in relation to events in their life situation, a certain lability of mood persisted.

According to the mood prevailing on examination they were classed as depressed, resentful, defiant, cheerful, resigned or indifferent. A group apart consists of men with grossly abnormal reactions.

(a) *Depression*—29%

In the St. Dunstan's atmosphere very few men are grossly and patently depressed. To all appearances they are cheerful and keep their chins up. Some keep away from their fellow sufferers; the noise of the crowd grates on their nerves, their "childish chatter" annoys them. Others need company to keep their own spirits up. If left alone or idle, they become moody; their mind begins to dwell on the past. They either conjure up horrifying battle experiences or think of the good times which they have had in the army. They also recall pre-war pleasures which will now be denied to them. In these moments of moodiness they feel shut out, debarred from all that is gay in life, unwanted, a nuisance to other people, an exhibit for their uncalled-for curiosity. "Why did this happen to me?" they ask themselves and "How did I deserve it?" A little incident may set them off—passing a spot well-known in by-gone times, a piece of music heard in better days, a soldier talking about where he has been, or a war film—bringing back their own experiences. Men, previously tough as nails, complained that now they had become emotional or sentimental.

Restlessness is often coupled with their moody spells. A blind man contrite and full of pious resolutions after several nights of heavy drinking, may decide to spend a quiet evening. He starts a conversation with another blind man but soon gets bored. He picks up a Braille book, reads a few lines and slings it down. "To hell with the Braille book," he thinks. He starts typing a letter but cannot think of anything to write. Unable to stick it any longer, off he goes down to the "pub" again.

(b) *Resentment*—11%

Almost every blinded man has a grudge against fate. He resents his own handicaps and the obstacles placed in his way, literally and metaphorically. This resentment becomes a prominent feature in a group of blind men in whom it may occur, either related to depression or without any traceable evidence of it.

Some men in this group are just peevish, ill-tempered, impatient and touchy. Others find a scapegoat for their resentment. Socially, and from the nursing point-of-view, these men are difficult to handle. They keep harping on their merits when they were sighted and finding fault with other people's work. They make themselves objectionable, and yet complain that nobody is fond of

them. At dances they are left "wallflowers," so they say. As regards the general public, they complain that people help them too much or too little. Assistance is offered to them when it is not required, or they are pulled and pushed about "like a sack of coal." Every act of kindness tendered to them is viewed with suspicion. "Pity is tripe," they say, or, alternatively, "People shouldn't let you stumble all over the blooming place." Their main grievance, however, is directed against their pension which they regard as compensation money. "Two quid a week," they argue, "is not enough for the loss of your eyes," and, "anyway there should be no need for a blind man to learn a trade. It's up to the country to look after him."

A few cases with grossly pathological reactions will be dealt with under the heading of Grossly Abnormal Reactions.

(c) *Defiance*—24%

Right from the start or after an initial phase of depression, a certain number of men, rather than decry their fate, adopt a defiant attitude towards their disability.

Typical of others is the case of a sergeant who, after distinguished service, was wounded in battle. A shell hit his Bren gun carrier and blinded him; without even giving a sound he carried on with his duties. The carrier broke down and cautiously one man after the other crawled out under enemy fire. As best as he could the sergeant helped his men to get out without even mentioning what had happened to himself. At the First Aid Post he insisted that the other men should be looked after before his turn came, until he eventually collapsed. Some days afterwards at the Base Hospital, the Medical Officer told him that he had bad news for him. The blinded man's first thought was that the offensive had failed and when he was told that he would be blind for life, it left him cool. It did not sink in; he did not grasp it.

Men of this type do not whine nor whimper. However much they suffer inwardly, when bitter experience has brought home to them the full significance of blindness, they suffer in silence, grin and bear it, and make up their minds to master their disability. Regardless of bumps and bruises they soon learn to get about alone. They settle down to their training with great seriousness and determination and are in a hurry to leave the Training Centre at the earliest opportunity. The necessity to provide for their dependents is con-

stantly on their minds. To give assistance to other blind men and to enter successfully into competition with sighted people give them great pleasure. The way they bear up calls for admiration on which some of them thrive; others resent it and just want to be regarded and treated as "normal." Some of them realize that they are constantly fighting against feelings of depression; others deny it stating that their only concern is to get on with the job.

(d) *Cheerfulness*—13%

In contrast to the serene and mellow attitude towards their disability adopted by some men after many years of blindness, others, especially during the early phases of their blindness, display a cheerfulness which has a ring of artificiality. This cheerfulness appears in two different forms; first, as an unreasonable, self-deceiving optimism regarding the recovery of their vision and secondly, as a facetious and fundamentally insincere jocularity.

(i) *Self-deceiving optimism*. Rather than face up to bitter reality a certain number of men take refuge in the erroneous belief that their vision will recover. Even men with empty sockets cheerfully accept their misfortune, firmly convinced that all will be well in the end. Unwilling to learn the unpalatable truth, they ask no questions about the state of their eyes and even when they are told that they will be permanently blind, they disbelieve their doctors. Any slender chance of improvement in their vision is clutched and magnified out of proportion. Years have passed since their blinding experience and yet some of the men still keep up their hopes that the miracle will happen.

(ii) *Jocularity*. In addition, some blind men display a remarkable general cheerfulness derived from a pre-existent cheerful temperament, exultation over survival, combatant pride and satisfaction, or from a deliberate attempt to deceive themselves and other people about the real state of affairs.

To the casual observer, these men seem to be in high spirits. They stress their happiness and feel sorry for people who are much worse off. The handicaps of a blind man in their opinion are insignificant; "He can do everything that a sighted person can do." Their future appears bright to them; really, in a way, they feel they have gained a good deal by their blindness. They laugh and joke all day with the nursing staff and their mates and they even relish a good joke about their blindness.

Some of them at least, clearly realize that they are acting. "You keep on deceiving yourself you can do things as good as a sighted person," said one of them, and "I keep a smile on my face and a

cheery note in my voice; at times it is an effort," said another.

(e) *Resignation* } —8%
(f) *Indifference* }

Six men in this series were classed as resigned, i.e., they fully realized their handicaps, but were not unduly disturbed by them. The term resignation seems to be preferable to acceptance because mild depressive elements were present in each case. Only one of the four last-war blinded had reached this stage of resignation.

Two dullards were more or less completely indifferent towards their disability.

(g) *Grossly Abnormal Reactions*—15%

Fifteen men suffered from severe psychological disorders brought on or aggravated by their blindness. Their psychiatric diagnoses were: confusional state 1, aggressive psychopathy 1, conversion hysteria 4, obsessional state 1, schizoid state (paraphrenia) 4, schizophrenia 2. Two men suffered from psychological disorders as the sequel of cerebral injury. The number of grossly abnormal reactions in this random sample is too large to be dismissed as due to oddities.

(i) *Conversion hysteria*. Dependent trends noticeable in many blind men, even despite an avowed desire for independence, are present, to a very marked degree, in the group labelled conversion hysteria. These men are often referred to as very exacting or demanding by the staff. As is characteristic of the hysteric, men in this group grotesquely exaggerate and dramatize the inevitable handicaps of the blind and, unrecognized by themselves, they exploit their disability to obtain affection and sympathy or to avoid—what they regard as unpleasant—work. On examination they were plaintive, self-pitying and tearful. Two of them had developed dramatic fits since they were blinded and two had become sleep-walkers.

(ii) *Schizoid states*. In previous sections it has been pointed out that blindness not infrequently gives rise to undue sensitivity, suspicion and jealousy. Cutting off of one of the most effective means of communication with the outer world, forces the blinded individual to fall back on his own resources and may in turn lead to solitariness and to dreaminess. A combination of these features brings about a clinical picture which, to all intents and purposes, conforms to that of Kraepelin's paraphrenia. Blind men of this group prefer their own company to that of others and are bizarre in

their habits. One of them could be seen walking about carrying on his shoulder a parrot which he regarded as his only friend. In gross exaggeration of what has been said about the resentful type of reaction, these men are subject to delusions of jealousy, and to ideas of reference and of persecution. While it is unfortunately true that occasionally people take advantage of the blind man's inability to see, these men's elaborate accounts of how they were robbed, cheated and ill-treated, bear the characteristics of a paranoid formation. With their sense of reality badly distorted, their emotional life seems to centre almost exclusively around the imaginary wrongs done to them, whilst their blindness means little to them. If they comment on it at all, they regard it as a new and "rather interesting experience."

Of the two men who developed a typical schizophrenia, one had sustained a severe head injury; in the other, schizophrenic symptoms set in when his mother, to whom he had always been over-attached, visited him for the first time in hospital.

VII. FACTORS DETERMINING THE EMOTIONAL REACTION

A. MAIN FACTORS

The type of emotional reaction to blindness is determined by five main factors:

1. Previous personality
2. The "St. Dunstan's Spirit"
3. Social situation
4. Occupational situation
5. Time.

1. Previous personality

(a) *Depression.* Three different personality types, about evenly distributed, reacted to blindness in a depressive way: (i) Individuals who had always adopted a cheerful outlook on life and who swung over to the other extreme when misfortune befell them. (ii) Men who had always been retiring, shy and self-conscious. As they were uncertain of themselves, they had always needed reassurance by others to uphold their self-esteem. They had always been unusually afraid of failure, and the advent of their blindness had finally convinced them that their struggle to make themselves socially acceptable had been in vain. (iii) Active, energetic, ambitious individuals incapable of tolerating the collapse of their previous hopes and ambitions. Their power of resilience was not

strong enough to start afresh in good heart. Men of this type suffer more than others through the restrictions imposed by blindness upon their working capacity, their independence and their activity in general. This resulted not infrequently in restlessness.

(b) *Resentment.* About half of the members of this group had always been "awkward customers"—disgruntled, temperamental, or quarrelsome; the remainder did not conform to any specific personality type.

(c) *Defiance.* Men who adopted a defiant attitude towards their blindness were made up, without exception, of individuals with a severe sense of duty and of responsibility. On previous occasions they had shown determination and dogged perseverance in attaining their objectives and in overcoming difficulties. Some of them had been stubborn, if not pigheaded, before they were blinded. Rather than be discouraged they were spurred on by their handicaps. They did not pass into depression because their sense of duty and of obligations towards their dependents, their pride in themselves not infrequently coupled with vanity, their personal ambitions and, last but not least, a certain competitive spirit prevented them from accepting defeat.

(d) *Cheerfulness.* Eleven of the thirteen individuals classed as cheerful had always been of a cheerful temperament. They described themselves in such terms as easy going, carefree and happy-go-lucky. They had "innumerable" friends all, like themselves, "fond of a laugh, a joke and a drink." They had never overworked themselves and had been satisfied with their modest achievements in life. As they had always looked on the bright side of life they continued to do so after they were blinded. This group also included a social climber who, through his disability, had achieved his life's ambition, and a deeply religious man who, with cheerful serenity, bore the cross which had been laid upon him.

(e) *Resignation.* This group is too small to warrant any conclusions.

(f) *Grossly abnormal reactions.* One of the four men with super-added hysterical symptoms had displayed gross hysterical symptoms before he was blinded. The three others had been aggressive psychopaths, one of them a chronic delinquent.

Only one of the four men with schizoid reactions and one of the two schizophrenics had presented features, prior to their blindness, suggestive of their subsequent breakdown.

2. *The St. Dunstan's Spirit*

Admission to St. Dunstan's considerably relieves the blinded man's mind because here he lives in a community of blind men, and the sighted people with whom he comes into contact are accustomed to the blind and know how to handle them. The fact that so many other men share his fate gives him comfort and, with blindness no longer the exception but the rule, he begins to feel sorry for those with additional defects such as deafness and loss of limb and especially for the blind women. He is stimulated by the example of other men who, in the course of time, have learned to master some of their handicaps and arguing that if "they can do it, so can I," he soon tries to emulate them.

He senses that the staff, seriously and enthusiastically devoted to their difficult task, are all out to help him and to make him feel that he has entered a large and happy family. This impression of a family is underlined by the custom of the men being addressed by their first names, and the fact that the staff frequently refer to them as "the boys." The men are encouraged to take their troubles to their respective matrons who, with a motherly approach, try to assist them.

Kindness is shown all around without too much fussing and every conceivable effort is made to cheer these blind men. To prevent them from morbid introspection, plenty of entertainment is offered to them.

Right from the start it is impressed upon the men that blindness is a handicap and not an affliction. Men who made a success of life despite their blindness are held up to them as shining examples. Again and again throughout their course of training it is pointed out to them that blindness can be conquered and that eventually they will leave St. Dunstan's as self-supporting citizens if only they will exert their will power to these ends.

Disabled men more than others react badly to regimentation, they react violently to any attempt at imposing rigid service discipline. There are no punitive disciplinary measures at St. Dunstan's apart from removal of obstreperous men in very rare cases. Rather than rely on fear as a deterrent, it has been St. Dunstan's policy to build up a very high group morale which, with its components of camaraderie, esprit de corps, "regimental pride" and singleness of purpose, makes for good conduct and performance.

With very few exceptions the blind men are very grateful for what has been done for them at St. Dunstan's, to which, like school boys, they preserve a sense of loyalty after they have left the

community life of the Training Centre. Like members of an Old Boys' Association, they feel that they owe it to St. Dunstan's to live up to its tradition.

3. *Social situation*

(a) *The Community.* The blinded adult, in contrast to the congenitally blind and those blinded in infancy, has lived a life in the sighted world. From the moment he is blinded he leaves this world and enters another which is totally different in many ways. The entry into the new world means the abandonment of much that he had previously cherished and entails a complete social readaptation.

This readaptation like any other of a similar kind, e.g., transplantation of an individual into a foreign country, is difficult. The foreigner for instance may hanker so much for his country of origin that he lives in the past and repudiates the present; he may join the minority of those who are in a similar position; or if he decides on assimilating himself to the new environment, he may either make himself acceptable or by over-doing it, he may make a fool of himself. In the latter case—and not only in the latter—he runs the risk of being put into his place.

All four modes of behaviour occur in the blinded. There is the ex-regular who still clings to the life that he loved; the embittered man who, alleging that sighted people fail to understand him, withdraws into the world of the blind; the man who joins the sighted and is accepted by them almost as one of them; and there is the blind man who frantically, alas in vain, tries to pretend that he is not different.

The spectacle of war blinded, on the other hand, brings the community into contact with the unpleasant aspects of war which everybody knows to exist, but which many people do not like to face. Full realization of their existence calls forth in the community, clearly recognized by few, fear of a similar fate, and satisfaction and guilt over being in a more fortunate position. Their sense of social obligation compels the responsible members of the community to help the war disabled as much as they can but, going beyond the attainable, some want to see the badly maimed happy and like to think of them as being happy even if they are not.

After a little training and experience most people learn with great ease, how to deal with blind persons (see Section VIII). Attentive but unobtrusive and without ever interfering with their desire for independence, they do for the blind what

tact what they cannot do themselves, treating them all the time as "normal" in all possible ways.

But the public's ignorance about blindness, their excessive social conscience or amazing lack of it, make the blind man's social intercourse with the sighted world undoubtedly difficult.

Generally speaking, to witness a catastrophe such as blindness is awe-inspiring and, as in the case of a visit to a house of mourning, people are reluctant to approach a blind man, to visit him or even to talk to him. Blind men often complain that their presence has a dampening effect on other people's hilarity, that previously well-trying friends now shun their company and that, for instance, in a railway compartment, people seem to be scared of entering into conversation with them. If the barrier is broken, sighted people are apt to be unnatural in their talk because they are afraid of saying the wrong thing.

In addition, their own deep-rooted fear of blindness, identification with the blinded, and non-combatant guilt combined with common misconceptions regarding the real handicaps of the blind prompt many sighted people to adopt an admiring, patronizing or sloppy pitying attitude towards them. Remarks such as "Isn't it a shame?" are just as much out of place as expressions of admiration—"Isn't he marvellous." Most blind men hate charity and yet on return to their home town, money offers may be forthcoming and collections are arranged for them. They want to be inconspicuous but if they drop in at the "local" they may soon be made the topic of conversation and, whether they like it or not, people insist on standing them free drinks. With very little assistance, blind men are perfectly capable of sitting down, of opening doors, of boarding busses and of crossing roads (if there is not too much traffic), and yet well-meaning people push them into chairs, lift them into vehicles or make them bump into the edge of a door by opening it towards them. No wonder that blind people become weary, wary and chary of too much kindness.

Other sighted people by contrast are thoughtless or inconsiderate. They fail to offer seats in trains and busses, block the blind man's way or leave their prams or pushchairs in the road. Instances have been given of sighted people passing disparaging remarks about the blind in their presence, of disbelieving their blindness (because they do not go about in a groping fashion) and even of taking advantage of their inability to see. But most annoying of all to the blind because fairly common are those sighted people who, because a man is blind,

seem to assume he must be deaf or may have lost his "senses" altogether. They yell into his ear, test his mental faculties and instead of asking him directly, they ask his escort in his presence about the blind man's likes, dislikes and habits.

(b) *Married life.* Deprived of his own vision, the blinded man finds great comfort in the certain knowledge that somebody who loves him, will "walk beside him through the world." His wife, on the other hand, whether or not she had been married to him before he was blinded, must be prepared to accept great responsibilities. From now on she will not only have to act as her husband's eyes, but much of her time will be taken up by reading to him, escorting him and attending to him in many small ways. For his sake she has to sacrifice a good deal of her pleasures and many of her personal ambitions and, despite assistance given by St. Dunstan's, the struggle may be hard.

Of 97 war blinded men, 44 had been married before they were blinded; 11 had become engaged and 8 had married since they were blinded. Four men stated that, owing to their blindness, either they or their fiancées had broken off an engagement; blindness led to separation of husband and wife in one of the last war blinded and in one of the blinded women.

Most of the women who had been married before their husband's blindness, "took it" very bravely and were a great source of encouragement to their blinded husbands. The news of the blindness was naturally a great shock to them, lessened only by the joy over having their husbands back, whilst pity for the injured man, at least for the time being, over-ruled all other considerations. Some men stated in fact that their ties to their wives had become closer than ever before. At first these women were apt to over-fuss their blinded husbands but they soon learned better. With tact most of them managed to disregard their husband's blindness without ignoring it and to raise their husband's self respect by playing down their own responsibilities.

Marital difficulties, if they did occur, were due either to the blind men's touchiness, irritability and jealousy or to their wives' domineering or mothering attitude towards them. A few women never got over it and "went ill with worry"; others openly resented their extra duties and being chained to a blind man.

Women who married or became engaged to a blinded man were prompted by genuine love irrespective of the man's disability, by hero-worship or by pity. The fact that most of these women were

a good deal older than their blinded fiancés or husbands, suggests that maternal feelings towards them played a prominent part. The period of observation is too brief to draw any conclusions about the success of these marriages.

Some blind men were disinclined to have children; others were quite prolific. Up to 4 years of age children seem to take little notice of their father's blindness, assuming that every man must be blind if their father is blind. Older children are proud of being able to help their blinded father.

4. Occupational situation

After the last war, service-blinded were trained by St. Dunstan's for many jobs (such as basket-making, boot repairing, rug and carpet making, netting, poultry keeping, massage and telephone operating). The majority of these jobs were performed in their own homes. In 1935 on the initiative of Sir Ian Fraser and Mr. Harry Bennett, St. Dunstan's introduced industrial machinery into their Raglan Street Work Shop. It was the success of this pioneer experiment which led to the opening by St. Dunstan's of their Industrial Department in 1941. By the end of April of that year the first blinded man was working in a factory. Their training centre at Church Stretton now trains blinded men to the requirements of factories wishing to employ them.

This development enables many blinded men to earn far more than was possible in the majority of cases when they worked at home. Also many of them are happier leaving the home every day to mix with the sighted world, as they did before their injury. The men themselves say that when their working day is over they can go home and relax, whereas when they worked at home they never knew when to stop.

Thirteen of the 97 warblinded men in this series had worked for 12 months or over. Eleven of them, of whom 5 were blinded in the last war, were working in industry, one a progress chaser, one splicing, one gauge inspector, one fuel tank pressure tester, one man building up air intakes, one identifier, one assembler, one capstan lathe operator and three men on deburring. With 3 of the men, retraining became necessary because of a change-over in production at their place of occupation. Of the remaining 2 of the 13 men, one was a tobacconist and the other, a workshy, hysterical individual, a sweeper. The progress chaser and the sweeper were semi-sighted.

Twenty-eight men at the time of examination were under training as: masseur 9, telephonist 7,

upholsterer 5, capstan lathe operator 4, router operator 1, assembler 1, market gardener 1.

Sixteen blind men (including 2 civilian blind) were examined at an aircraft factory. The object of this investigation was to obtain information about the readaptation of the blinded to civilian life outside of St. Dunstan's and about their employability in industry. The results of this investigation have been published elsewhere.

They are in brief:

(1) Employment of the blinded in industry can be an advantage rather than a burden on production; the output of the blinded workers is equal to and not infrequently considerably higher than that of the sighted.

(2) Emotional factors making for good work performance apart from the purely material factor of lack of distraction, are: disinclination to relax, anxiety about the future, and a desire to assert independence in spite of disability. Many blind men find satisfaction in their work but dread their leisure hours when they become dispirited. They are therefore eager to work extra hours, but do not stand up well to periods of industrial slackness. Factory employment has put them on an equal footing with sighted workers, a position they are desperately anxious to retain. Constantly afraid of being regarded as inferior, they try to prove their worth, and if possible even to out-do their sighted companions.

Factors which impair a blinded man's working capacity are: the presence of severe depression which paralyses his capacity for work, fundamentally passive tendencies and an attitude of resentment to the world around him which he believes to be hostile.

(3) Employment on the Wadkin Fixed Head Router, progress chasing, splicing, gauge inspection, fuel tank pressure testing, building up of air-intakes and woodwork was successful.

Identifying and deburring are suited only for men of low intelligence. Both these jobs are very monotonous; deburring, in addition, coarsens the skin on the fingers to such an extent that after a month men on this job are unable to read Braille.

(4) Too commonly the blinded man's abilities are underrated. Employment in inferior jobs leads to discontent. The more skilled the job and the higher a blind man's working status, the greater the effect on his wounded self-respect. Some of the blind workers now have a higher status than before they were blinded.

(5) Their average income ranged from £6.8.6 (including pension) to £9.12.6 (the progress chaser).

also inclusive of pension). The blind worker is suspicious of being overpaid or of being underpaid as cheap labour.

(6) Because blinded workers are very conscious of danger, their accident record is lower than that of sighted workers.

(7) Although they did not always feel accepted themselves they were regarded by the sighted workers as members of the community in the factory in question.

5. Time

Men become accustomed to their blindness. As time goes by the initial upsetting effect abates and they build up compensations. Their new jobs may be of absorbing interest; as regards hobbies, playing an instrument, listening to music, woodwork or their own modest literary efforts may become great sources of pleasure. But this does not seem to affect the pattern of their emotional reaction which is laid down at a fairly early stage and, at least during the period of observation, remained fundamentally the same. Comparison of men seen within 12 months of their blindness with others 1 to 4 years afterwards, showed that in both groups, 50 per cent of the reactions were definitely mal-adjusted (depression, resentment, grossly abnormal reactions) and 50 per cent fairly well or well adjusted (defiance, cheerfulness, resignation). Individual retrospective histories suggest that depressive spells decrease in intensity and frequency with the passage of time, whereas resentful reactions are apt to consolidate and to deteriorate. As depressive spells recede, defiant elements come to the fore. Men of the defiant type do well if they are emotionally stable. The initial jocularity of the cheerful type disappears almost invariably. Both the defiant and the cheerful façade are likely to crack easily under the pressure of adverse circumstances. Generally it is to be assumed that if the period of observation could be prolonged a mellowing effect of time would be noticeable.

B. SUBSIDIARY FACTORS

(a) *Age*. Men over 35 years of age are more severely affected by blinding than men in their early twenties. An irresponsible youth if blinded, is primarily concerned about the curtailing effect on sport and other pleasures; if there is any chance left and even if not, he hopes that his sight will recover. If the youth is more serious-minded, perseverance in the face of difficulties usually prevails. Men more advanced in years, by contrast,

fully realize their handicaps and are apt to be disheartened. They are seriously concerned about their financial and occupational prospects in view of their commitments and obligations; to learn a new trade after many years in their own is obviously a serious matter for them.

(b) *Previous occupation*. Brain workers are more severely hit by blindness than manual workers because apart from training as masseurs, or telephonists, very few jobs are open for them. Employment of the blinded in industry has undoubtedly improved their prospects, but a lowering in social status and remuneration is often unavoidable.

(c) *Semi-sighted versus totally blind*. If there is very little vision left, the emotional reaction of the semi-sighted does not differ in any way from that of the totally blind. In fact their ability to see just a little may be more tantalizing than to be totally blind. Men with a fair amount of vision, i.e., those who can make out shapes though not features, are, on the other hand, at a definite advantage in the world of the blind. They derive comfort from the thought that others are worse off and satisfaction from being able to help them. Some of these men, at least at St. Dunstan's, regard themselves as fortunate in being able to see as much as they can; others, according to their temperaments and, to a certain extent, according to their actual prognosis, indulge in unjustified hopes of complete recovery of their vision or in gloomy thoughts over losing the little that is left to them. The former with hope of recovery still left in them, not infrequently fail to make a wholehearted effort in learning Braille and in their occupational training. Gross defects of vision also give rise to misinterpretation of what is seen, thereby intensifying the suspicion and jealousy so common in blind men. With a certain justification semi-sighted individuals often complain that at St. Dunstan's and outside, more attention is paid to and more allowances are made for the totally blind than for them.

(d) *Accident versus battle casualty*. A man severely disabled by accident is subjectively and objectively worse off than a battle casualty. If the accident occurred on active service, his situation is, of course, not very different from that of a battle casualty; but if he was injured on home service he feels in his own mind that he has cheated the country and himself about the job for which he was destined. The community, on the other hand, withholds from him the praise and the honours generally bestowed upon and reserved for the combatant soldier. As a result of this, many men blinded by accident are disinclined to tell other people how

it happened and are apt to stress unduly that they have done their bit. Some of these men have obviously very good reason to blame other people for the injury; others do so to relieve their own feelings of guilt. In general, battle casualties adopted a more defiant attitude towards their blindness than accident casualties. This may be due to a difference in personalities, to combatant pride or to both.

(e) *Repatriated prisoners of war.* Of 8 repatriated prisoners of war in this series, 3 were in a state of depression, one had developed a schizoid reaction, one was resentful, one ultra-cheerful, one indifferent, and one had resigned himself to his state.

(f) *Multiple injuries.* In addition to their blindness, a fair number of men sustained other severe injuries. Nine men in this series had lost an arm, 2 of them both hands; 12 suffered from considerable hearing defects. The emotional trauma of disablement and their reaction to it is, of course, very much intensified in these cases. Three of the 9 amputees displayed grossly abnormal reactions, 3 were in a state of depression, 2 were ultra-cheerful and one defiant; nervous complaints were common. With additional hearing defects, getting about alone is even more difficult for a blind man than otherwise; he has to rely entirely on touch. He is deprived of one of the most essential means of social contact left to a blind man and the morbid suspicion of the deaf is superadded to that of the blind.

(g) *Disfigurement.* In contrast to the one-eyed, blind men, as a rule, are surprisingly little concerned about their appearance because they cannot see what they look like. Even if their faces are covered with shrapnel marks or if there are grotesquely shaped scars, they readily accept reassuring remarks by others that their appearance has changed but little. Regarding their actual eye defects, preference for artificial eyes or for dark glasses varies.

Especially in painful surface injuries of the eye, e.g., mine explosion, burns and blank cartridge accidents, dark glasses are needed for a long period. Their use may become a fixed habit and the men find discontinuance very difficult or impossible.

Many a man likes to wear dark glasses to hide deformity of the sockets, in preference to artificial eyes although in these cases the underlying psychological factors play a part rather than the reason often given—"my sockets feel cold without them" or "the light hurts my eyes" (where no eyes are present). Another and very general feeling is that

the man's blindness will be appreciated by passers-by who will help him by clearing his way or where needed, give him actual guidance. This applies particularly to men whose eyes appear normal though they are sightless, e.g., cases of injury to brain or optic nerves. Such men and even men wearing two very natural-looking artificial eyes, complain much of sighted people who, not realizing the disability, jostle them in the street or abuse them for their clumsy actions.

Artificial eyes are usually wished for and worn partly for cosmetic reasons and partly for the comfort of a socket. The man's mental outlook to artificial eyes is naturally largely governed by the opinions expressed by his friends and relations and often enough a man is unsettled by thoughtless comment from a sighted person.

VIII. SUMMARY AND PRACTICAL CONCLUSIONS

In the preceding, an attempt was made to outline some of the problems with which blinded ex-servicemen are confronted. These problems exist in some ways perhaps even to a greater extent in other severely disabled men whose care and after-care are not so well organized as that of the war blinded. A survey of the social, economic, occupational and emotional difficulties of the war blinded was given. The existence of emotional difficulties in the severely disabled is generally admitted but many people with the very best of intentions, tend to minimize or to gloss over them because they wish to prevent the severely disabled from being regarded and treated as "mental." To counter this argument it should be pointed out that the emotional reaction to blindness in the majority of the men examined was "normal" though sometimes excessive, and that only a comparatively small percentage of them displayed grossly "abnormal" reactions.

For many people the welfare of the disabled is merely a financial matter which should be effectively dealt with by legislation. But an adequate pension, however desirable, does not solve all the disabled man's problems. If a change of job is required owing to the nature of the disablement, vocational guidance should be as perfect as possible. Adequate training facilities should be offered to the disabled and employers should be informed about the wide scope of their employability and about their working efficiency, which may be underrated. Publicity should be given to the social needs of the disabled and to the right approach to them. Skilful handling of their emotional difficulties, especially in the early stages, greatly assists in their emotional readjustment.

Practical conclusions drawn from our investigations concern training establishments for the blind, ophthalmologists and the general public.

(A) TRAINING ESTABLISHMENTS

(1) *Personnel.* The handling of the blind is not an easy matter. Hence personnel dealing with the blind should be carefully selected and trained. Commonsense, a good education, emotional stability, cheerfulness, kindness of heart, a severe sense of duty and a high standard of morality are in themselves, not sufficient criteria to ensure satisfactory handling of blinded ex-servicemen. To accomplish this, in the female personnel to whose care the blind men are largely left, emotional maturity, some experience in life, motherly instincts, interest in other human beings with ability to establish a positive rapport and serious devotion to their task are required.

(2) *Management.* On a rough and conservative estimate, 50 per cent of blinded men make a reasonable recovery without much special attention. These 50 per cent include men of the cheerful and of the defiant types of reaction and men classed as depressed whose grief over loss gradually abated. Thirty per cent require skilful handling (depressed and resentful individuals). About 20 per cent of men with severe or grossly abnormal reactions are definitely beyond the handling of a psychiatrically untrained staff.

In these cases, the help of a psychiatrist seems to be essential; he could also give advice if and when special problems arise. In view of the lengthy stay of the blinded trainees, the appointment of a resident psychiatrist is unnecessary. A visiting psychiatrist could make a survey of all the men and pick out those who need special attention.

Regarding general policy, the following suggestions may be offered:

(a) *Depression.* It is known from everyday experience that a well-meant attempt at cheering a severely depressed individual often has an effect opposite to what is wanted. Hence individuals severely grieved over the loss which they have sustained, should be left alone until they express a desire to come out of their shell. The full experience of depression in the blinded is a prerequisite to accomplish their recovery.

Boredom is one of their worst enemies. Entertainment offered to them achieves its object only if the blinded person, as much as possible, takes an active part in it. A great variety of entertainment is required. Too much entertainment has a tiring

effect and increases the gloom which almost invariably follows the transfer of the blind man to his own home. Prior to returning home he should, as a preventive measure, be induced to cut down his pleasures and to prolong his working hours.

In addition to the entertainments he should be encouraged to take up a hobby or hobbies which can occupy his hours at home after work. The Braille and Talking Book Libraries are of incalculable value but the widest possible use could be made of the varieties of occupational therapy he has received in his early hospital days—now as a hobby rather than as a treatment.

(b) *Resentment.* A firm and understanding approach to a blind man without regimentation goes a long way to prevent the establishment of a resentful attitude. Both frustrated and spoilt children are apt to be petulant. Sincerity and impartiality on the side of the staff may help to dispel morbid suspicion and to discourage jealousy. Due allowance should be made for the fact that the blind men's irritability is reactive to their disability. Real grievances should be adjusted, if possible; but to prevent a consolidation of their complaints these should not be taken at face value and should be neither supported nor flatly contradicted. A fair and sympathetic hearing should be given to them without many comments.

(c) *Defiance.* Neither an over-defiant nor an unduly dependent attitude is desirable in blind men. A man who has been spurred on too much or to whom too much has been promised regarding attainable accomplishments, is bound to be disillusioned at the best and to break down at the worst. It is preferable to point out to blinded men that they will have a long struggle against their handicaps in front of them instead of raising false hopes.

A fair number of men pay only lip-service to a defiant attitude towards their disability. Defiance can be expected only in men who prior to their injury were of a conscientious and persevering type.

(d) *Cheerfulness.* Ultra-cheerfulness, though pleasant for the observer, is not a healthy attitude towards blindness. It should be damped and, as in the case of over-defiance, the blind man should be induced to make a realistic assessment of his handicaps.

(3) *Training.* Undetected personality defects and emotional maladjustment seem to be the commonest sources of faulty placement and of failure at work. To expect all war blinded men—a cross section of the community—to be successful,

is obviously a foolish hope and, while every effort may be made to limit the "passengers," some must be expected to fail, and steps must be taken to meet their position. In the case of men unemployable by virtue of head wounds, multiple injuries or poor personality types, some sort of planned small community life with combined recreational workshop facilities, will in part, solve the problem especially where the family or an individual attendant cannot meet the difficulties and requirements.

Despite splendid progress in the employment of the blinded in industry, systematic job evaluation may still further enlarge the scope of their employability. In particular, the employment prospects and training facilities for men of the officer type are still far from satisfactory. The occupational training and placement of the more intellectual types present considerable difficulties. Able younger men are sent to university or training college—reading law or history and those with engineering bent or experience are successfully trained. Outdoor occupations *e.g.*, poultry farming, have proved very uncertain and in the main, it becomes very much an individual problem calling for thought and effort for each man so that as far as possible, his social and intellectual level may be maintained and work and interest provided on a long term basis. Employers seem much less willing to take a blind man into a higher grade position than to accept a man into machine or other industrial level employment.

(B) OPHTHALMOLOGISTS

When the man first asks about his eyes, the ophthalmologist should if he thinks the general condition allows, tell him the truth. It may well be that it is too early to say with certainty what, if any, hope of sight remains. But he should be told; and if both eyes are hopelessly destroyed, a careful and tactful explanation will prove better in the end than false advices leading the man and his relations to think there is a hope of sight. In general a full and sympathetic statement with reassurance as to what usefulness of life lies before him, will not only be courageously and appreciatively received, but will sometimes actually give some peace of mind in place of fear and uncertainty.

As a working rule an eye, however useless, should not be excised except for pain or where it carries a menace to whatever sight remains in the fellow eye. Advice about the removal of a grossly unsightly blind eye should be approached with care, for the finality it gives to hope of some vision

is often just what the man has been struggling to avoid. Faint, but quite unjustifiable hope should not be roughly damped any more than encouraged, once a clear and sincere prognosis has been given. It may slowly die but while it lasts it may be of considerable help to the man.

(C) THE GENERAL PUBLIC

Sighted people unfamiliar with the blind make common mistakes. To avoid these mistakes, the following hints may be useful:

(1) Do not shout: a blind man can hear perfectly well unless he has an additional hearing defect.

(2) Address a blind person directly and not his escort. Blind persons are rightly annoyed if their escorts are asked "does he smoke?" or "does he take sugar in his tea?"

(3) Blind persons dislike pity as well as admiration. Expressions such as "isn't it tragic?" are just as much out of place as "isn't he marvellous."

(4) Make your presence known on entering a room in which you meet a blind man as otherwise he may be startled. For the same reason do not touch him without a warning. If he does not easily recognize your voice, introduce yourself.

(5) Say when you are leaving, or the blind person may be left talking into thin air.

(6) Do not ignore, but disregard his disability in conversation. On the other hand, if his blindness crops up in the conversation, he knows that he is blind and does not mind references to it if made tactfully. Use the word "see" liberally; a blind person does not like to be reminded of the fact that he cannot see, *e.g.*, say "would you like to see this object?" or "did you see Mr. X. yesterday?"

(7) Blind people are anxious to prove their independence and hate over-fussiness, hence do not rush to help a blind man (unless of course, he is in danger of hurting himself), without waiting to see if help is wanted. For instance, a blind man may be fumbling for a door handle; according to his temperament, (a) tell him where it is, (b) direct his hand, (c) offer to open the door. Never open a door towards a blind man because he may bump into it.

A blind person may be crossing a road. Even if he crosses it diagonally, leave him alone unless you are convinced that he has lost his way. Do not put him off his direction.

(8) If he needs assistance, give it in a matter of fact manner. If in doubt, do not be afraid to ask a man the best way to help him. He will be

glad to tell you and will appreciate the fact that you have asked him.

When escorting a man, let him take your arm. In this way, you are slightly ahead of him and so are able to give him warning of a step, or variation of ground. When coming to steps, give a definite warning either by speech or some pre-arranged signal such as a drop or lift of the arm on which the man's hand is resting. Avoid using the word "take" when asking a man to go out with you. It calls to mind his handicap.

The escort should go ahead when passing through a doorway, getting into a bus or train or walking along a narrow path. Always avoid pushing a man ahead of you. When helping a man into a car, tell him which way the car is facing and whether you are expecting him to get into the front or back seat. It is often helpful to place his hand on the top of a car as he goes through the door.

In an unfamiliar room, if he wants to sit down, guide him to a chair until he can feel it with his knees or hands. His hand may be placed upon the back of the chair but do not push him into it. Tell him who is sitting on either side. If in conversation, you offer him a cigarette, put it into his hand and get an ashtray for him. Tell him that it is there and where it is or put his hand on it.

A lady who accompanies a blind man to a restaurant should read out the menu to him and let him do the ordering. Eating of fish or poultry without assistance is impossible for him; assistance will be gladly accepted. If after the meal, the lady tells him that she wants to wash her hands and asks him whether he wants to do the same, she will avoid causing embarrassment.

Many people are eager to stand free drinks for

a blind man. If he insists, it may be preferable to allow him to pay for his drinks and to stand a round himself.

Care should be taken to make a blind person as inconspicuous as possible in public places.

(9) Blind people are sensitive and suspicious. Hence explain what you are doing in the presence of the blind unless your acts are obvious.

Give a running commentary on what you see when out for walks; especially if something causes laughter, explain what is happening.

When reading a letter for them, be as impersonal as possible, because you are only lending your eyes. Make no comment when you have finished unless the man should invite you to do so.

Sighted people are often tempted to make signs to each other in the presence of a blind person. If he notices this, and he does more often than is generally assumed, it rouses his suspicion.

Never hurry a blind person; he is bound to be slower than sighted people.

Start a conversation with a blind person in a railway compartment. Blind people often complain that nobody talks to them.

Not to keep a promise is generally regarded as ill-mannered, but blind persons react to it more severely than others.

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TREATMENT OF WARTS BY SUGGESTION

HERMANN VOLLMER, M.D.*

These pages attempt to overcome a wide-spread scepticism toward the curative value of suggestion in the treatment of warts. Many authoritative quarters and competent men still entertain the belief that warts disappear spontaneously, and that suggestive treatment does not influence in any way this natural course. Their sceptical attitude is well understood. Warts are benign epitheliomata caused by a virus (6). It is difficult to see how suggestion should cure a disease of this character or even be an adequate approach to it. That the idea appears entirely illogical and irrational does not prove it to be wrong, nor does the fact that observed phenomena or their correlations are incomprehensible render them less important.

The problem of the cure of warts by suggestion is complicated by an inherent difficulty: It is very easy to disprove. A few unsuccessful trials of an individual or a well-controlled series of observations may cause this therapeutic idea to be discarded as charlatanism. However, failures by individuals to cure warts by suggestion does not disprove the validity of the treatment. We shall discuss the reasons later.

Warts have been treated throughout the centuries by laymen. Everywhere in the world there were people who could remove warts by a great variety of mysterious procedures. Warts were rubbed with a thread and disappeared. Or, as many nodes were made in a string as there were warts, the string thrown behind the patient's head, and the warts disappeared. Pork fat or the juice of milkweed, calandine or lemon was rubbed in, and the warts disappeared. Even magic words alone could do the miracle if only the right person used them in the right way. Not everybody could do it. Obviously physicians did not do as well with their art as these laymen with their irrational, uncanny, and mysterious performances.

Physicians, of course, condemned and, up to a certain time, misunderstood those lay methods. They tried to eradicate such medieval superstition and to conquer this field with the scientific means at their disposal. Rulison (10) gives an impressive enumeration of therapeutic methods which have been used with more or less success. Their variety almost surpasses that of the lay methods. Warts

have been destroyed by excision, curettage, heat, cold, caustics, and keratolytics; infection and scarring often followed these uncomfortable methods, and relapses were not an exception. Local application of collodion, elastoplast, silver nitrate, fluid extract of thuja, solution of potassium arsenite, castor oil, and oil of cinnamon has been used by physicians with varying success. Roentgen irradiation, radium therapy, and electrodesiccation have been applied. Oral administration of protiodide of mercury and of magnesium sulfate and injections of bismuth or arsphenamine and finally of autolysates from human warts have been recommended by different authors. This is by no means a complete list of all treatments ever used, but it sufficiently demonstrates that no connection between them exists. The literature on this subject is quite confusing. One fact repeats itself throughout all publications: A certain treatment found highly effective by one investigator proved to be entirely disappointing to another.

This state of affairs seems to permit the following conclusions:

1. A great variety of means is used for the treatment of warts by laymen as well as physicians.
2. None of these seems to be a specific remedy for warts.
3. Whatever method is used, it is successful in the hand of one person and ineffective in the hands of another, whether layman or physician.
4. That means: the success of treatment depends on the person who uses it rather than on the method used.
5. The only acceptable explanation for such a correlation is a suggestive influence of the person who applies the treatment.

Such an interpretation has first been voiced in the French literature by Brocq (4), Nini (7), Pech (9), Vieille (13), Orłowski (8), and particularly Bonjour (3). The first extensive study was published in 1927 by Bruno Bloch (2), an outstanding Swiss dermatologist. He treated 178 cases of verrucae vulgares and 50 cases of verrucae planae juveniles with suggestion. One hundred and seventy-nine cases were followed-up. Eighty-eight and four tenths per cent of the verrucae planae juvenile cases and 44.1 per cent of the verrucae vulgares group were cured, the majority within

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one month. Acknowledging the fact of spontaneous healing of warts, Bloch (2) believed that such a high percentage of cures within such a short period of time could not logically be ascribed to spontaneous healing alone. Unfortunately, Bloch's conclusion is not supported by the observation of a control series of untreated patients. However, Rulison (10), in a statistical study of 921 cases found the average duration of untreated warts to be between two and three years. The shortest duration in this series was one month, and the longest twenty-eight years. Accordingly, spontaneous healing of warts within one month is to be expected in not more than 3 to 4 per cent of cases. This is a considerably lower figure than the percentage of cure by suggestion in Bloch's series, and seems to justify Bloch's conclusion that warts can be influenced by suggestion.

Following Bloch's publication, which refers mostly to adults, I have treated more than one hundred children having warts during the past 17 years. The majority were of the verruca plana juvenilis variety occurring in great numbers particularly on the hands and on the face. Most of these patients were seen in private practice where warts were incidentally found during an examination for other reasons.

METHOD

The directions of Bloch (2) were followed with various modifications and adjustments to the age and personality of the child. To apply suggestive treatment during the first two or three years of life appears absurd. Incidentally, warts were not observed at this early age. It is imperative that the child comprehends the procedure and is impressed without being frightened. The following method was used in the majority of cases: The warts were first carefully inspected and counted. If they were localized on the hands, the hands, with the fingers spread, were placed on a sheet of paper and outlined with a pencil. On this sketch, the warts were marked in natural size with a red or blue pencil. The child was asked to take this drawing along after the treatment and to follow daily the progress of the cure by comparing the real warts with those on the sketch. Only few patients were blindfolded as was generally done by Bloch (2); many children resented this procedure, and were more frightened than impressed by it. They wanted to see what was going on. All children were told exactly what I was doing. "I am going to paint your warts with a blue (or red) fluid. It will not hurt, but the warts will go away. Don't wash

your hands today, and don't touch the warts any more until they are gone. Now watch carefully and you will feel a very faint tingling in your warts. That is a sign that they will soon disappear." If the child felt this sensation, the suggestion obviously had "taken." If he could not feel anything, repeated treatment was arranged for, or the present treatment continued. For instance, irradiation with red or blue light—usually the color of the dye used on the warts—was carried out, and the suggestion repeated that tingling would be felt in the warts. In older boys, particularly those who were mechanically minded, more impressive weapons such as a noisy x-ray machine—without actual irradiation—were used. Or the treatment was carried out in a dark room. Various dyes and colored fluids were used at random: methylene blue, carbol fuchsin, tincture of metaphen, even ink in several cases. A few children received injections of substances said to be remedies for warts, which in reality were immunizing agents such as diphtheria toxoid and indicated at this time.

The creation of a certain atmosphere seems to be more important than the choice of the dye or apparatus in the treatment of warts. A noisy clinic or an overcrowded office with an efficient nurse going back and forth and trying to get the next patient in is not a suitable place for such a performance. Neglect of these factors invariably results in failure. The physician has to take his time, has to be in a proper state of mind, has to concentrate and to be convinced of what he is doing.

RESULTS

The results have been in agreement with those of Bloch (2), Bonjour (3), Sulzberger and Wolf (12), and others who treated warts by suggestion; and also with the results of Grumach (5), who injected saline pretending it to be a new remedy for warts; and with those of Biberstein (1), who injected autolysates from human warts, convinced that he was dealing with a specific treatment for warts. The rate of success in children was somewhat higher than that reported in adults by other writers. Failures to cure verrucae planae juveniles were a rare exception and could usually be traced to a definite cause such as mental deficiency of the patient or a poor performance of suggestion. The warts often disappeared within four days leaving no scars; the longest interval between treatment and cure was seven weeks. A swelling of the warts followed by recession was repeatedly observed. Occasionally warts would recede, but grow larger

again before they finally disappeared. One had the impression that two opposed forces played a role in the course of healing. Relapses occurred but rarely.

Common warts (*verrucae vulgares*) responded less promptly and appeared more resistant to treatment by suggestion. About one third of these cases were unsuccessfully treated. It took rarely less than three weeks for common warts to disappear. Frequently an inflammatory swelling of the wart and the surrounding tissues took place before healing occurred. Subsequently the warts dried and fell off, leaving a slight depression which later disappeared without scarring.

For obvious reasons no tabulation of the results can be presented. Only two children could be observed throughout the course of healing since they were hospitalized for other reasons. In these cases it took 7 and 23 days respectively until the warts disappeared. Warts were usually not regarded by the parents as a real disease and as reason enough to see a doctor; they were discovered incidentally at other occasions. It was therefore difficult to make successful return appointments at short intervals. In the majority of cases one had to rely on the information given by the parents or patients themselves. Such data could not be accepted for tabulation and statistical evaluation but gave a fair idea of the time when healing took place.

A few cases are described which could be observed at regular intervals:

Case 1. The 9-year-old daughter of a dermatologist had numerous warts (*planae juveniles*) all over her face and had previously been unsuccessfully treated by her father and another dermatologist. Only the largest wart was treated with methylene blue. The child was informed that this was the "mother wart," and all the others would disappear with this main wart. The parents made sceptical remarks to this comment. Nevertheless, 4 weeks later all warts were considerably smaller and more flat. Now the whole face was irradiated with blue light, and the suggestion renewed. Two weeks later all warts had disappeared without leaving a trace.

Case 2. A 7-year-old boy had for several months a number of *verrucae planae juveniles* on his chin. They were treated by suggestion (blue light) and were about to disappear 24 days later. However, by this time numerous new warts had appeared on his right cheek. The boy was brought to the office not for this reason but for diphtheria immuni-

zation. It was explained that the warts would first be treated, and diphtheria protection given later. This day diphtheria toxoid was injected and said to be a new remedy for warts. The suggestion was given that shortly after the injection a slight burning would be felt in the warts, and that this would indicate a rapid cure. The patient confirmed having this sensation. Seventeen days later, when the boy came back for another injection, his warts were almost invisible. One week later they had disappeared entirely and did not recur.

Case 3. An 11-year-old, neurotic boy who had been in psychoanalysis for more than a year showed several large *verrucae vulgares* on his hands. Only one treatment by suggestion (methylene blue) was given whereupon the warts were reduced to half of their previous size, one week later. The boy did not return for further treatment. He was seen again 5 months later and reported that the warts had disappeared entirely but recently recurred. This time he came specifically for treatment of his warts. Methylene blue and four "x-ray treatments" (noise of an old engine) were given during which his eyes were "protected" with dark glasses. He was obviously impressed. Three weeks later all warts were gone.

Case 4. The 8-year-old sister of Case 3 who had witnessed the "miracle" on her brother showed 10 common warts on her hands. An outline of the hands was drawn, and the warts marked in natural size with a blue pencil. She received the same treatment which had proved so successful in her brother, only once. After 6 weeks the warts had disappeared without scarring.

Case 5. A 20-year-old student had for several years a few large common warts on one hand. Suggestion with methylene blue and irradiation with blue light were given, whereupon the warts had almost disappeared 2 weeks later. At this time the suggestive character of this treatment was revealed to the patient. Two weeks later, the warts had resumed their original size, and further treatment remained unsuccessful.

Case 6. A very suggestible girl of 5 years had a great number of *verrucae planae juveniles* over her face and hands and was unhappy about them. She was casually told that they could easily be made to disappear. She was very anxious to get the treatment, which consisted merely of touching the warts in a dark room, accompanied by verbal suggestion: "This one will disappear, they all will go away in a short time." Nine days later all warts had disappeared.

Case 7. An 11-year-old feeble-minded boy with numerous verrucae planae juveniles on his hands received 4 painless faradisations at one week intervals accompanied by appropriate suggestion in simple words. Three months later no change could be noted.

The report of cases could be continued but would not contribute more information. The above examples were chosen for their special features.

DISCUSSION

From the experiences of competent dermatologists such as Bonjour, Bloch and Sulzberger and from my own observations it seems that treatment of warts by suggestion is at least as effective as any other treatment, whether it consists of internal medication, local applications, injections, irradiation or surgical removal. Equally good results have been obtained by laymen and physicians with a great variety of methods which have nothing to do with each other, some of them representing most primitive and mysterious procedures. The only common denominator of all these methods is an intensive therapeutic approach to the patient or his warts. We know that every therapeutic procedure implies a suggestive component. It is therefore reasonable to assume that, with the exception of radiotherapy and surgery, all methods used for the treatment of warts act mainly as suggestion.

The second important fact is that warts disappear spontaneously. According to Rulison the average duration of untreated warts is between two and three years. Following treatment by suggestion the majority of warts disappear within 2 to 12 weeks, verrucae planae juveniles of children disappearing even more quickly, within 2 to 3 weeks. Very similar morphological phenomena are observed in warts which disappear spontaneously and in those which are cured by suggestion. It is possible—and this would be the most acceptable theory—that treatment by suggestion merely accelerates the process of spontaneous healing. If this theory could be supported, at least some of the obscurity of the wart problem would be eliminated, and the critical scientist could feel relieved.

Samek (11) made a valuable contribution in this direction by studying the histology of healing warts. He referred to Unna's observation on healing warts that the surrounding normal cutis shows a warding-off reaction against the epithelial neoplasm; this reaction consists of hyperemia and cell proliferation. The life time of a wart seems to depend in part on the degree of those defense mechanisms which contribute to the degeneration of the wart. During

the healing process of warts treated by suggestion, Samek found similar inflammatory changes in the cutis, which consisted of moderate dilatation of the blood vessels with engorgement and hyperemia as well as perivascular infiltration. In the epidermis, the mitoses which are characteristic of growing warts became rapidly less numerous, and degenerative changes appeared in the epithelial cells.

These findings deserve further investigation; they support the assumption that cure by suggestion and spontaneous healing are similar processes, and that successful suggestion merely accelerates the spontaneous healing of warts.

That suggestion may have such an influence is intelligible, and not a mysterious speculation. The effect of psychic influences on capillaries is a known fact. A labile equilibrium seems to exist between the vitality of the normal surrounding and the pathological tissues of the wart. Under such circumstances, suggestion, by causing hyperemia, might well give preponderance to the surrounding tissues.

Whoever wants to disprove this theory and the efficacy of suggestion on warts will easily succeed. A suggestion given by a person who does not believe in what he tries to suggest will always be unsuccessful. For, suggestion is the insinuation into the mind of some belief—or disbelief. A historic example, reported by Sulzberger (12), illustrates this correlation very well: Jadassohn who first demonstrated that warts are inoculable, tried the psychotherapy of warts for twenty years without success until convinced by Bloch (2) that it is a genuine cure. Then he could succeed also. Furthermore, it is known that one physician is more successful than the other, depending on the varying degree of conviction and suggestive ability. The same physician may have varying success corresponding to the variability of his state of mind, concentration and interest in the treatment.

On the other hand, suggestible individuals such as children are easier to cure than less suggestible persons. It will hardly be possible to influence idiotic children by suggestion, as one of the reported cases demonstrates.

Thus contradictory reports in the literature are easily explained and support rather than disprove the influence of suggestion on warts.

SUMMARY

Warts in children can be cured by suggestion. The results seem to be better in children than in adults. Verrucae planae juveniles respond to treatment by suggestion in a higher percentage of cases

and within a shorter time than verrucae vulgares. Children below three years of age and feeble-minded individuals are not suited for this treatment.

Warts have a tendency to heal spontaneously. However, the average duration of untreated warts is more than ten times longer than that of warts treated by suggestion.

The great number of other methods which have been recommended in the literature for the treatment of warts are probably unspecific, and, with the exception of radiotherapy and surgery, act mainly as disguised suggestion.

It is assumed that cure by suggestion and spontaneous healing are similar processes, and that successful suggestion merely accelerates the spontaneous healing of warts by causing hyperemia in the surrounding tissues. This opinion is supported by histological findings of Samek.

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REVIEWS OF PERIODICAL LITERATURE

ENGEL, G. L., AND ARING, C. D.: *Hypothalamic Attacks with Thalamic Lesion. I. Physiologic and Psychologic Considerations.* Arch. Neurol. and Psychiat., 54:37, 1945.

To the authors' knowledge this is the first report about "a destructive and fixed lesion outside the hypothalamus leading to disturbance of hypothalamic function with repeated display of exaggerated hypothalamic activity." A cystic degenerative lesion involved mainly the dorsomedial and lateral nuclei of the thalamus and probably interrupted some corticohypothalamic association fibers. The hypothalamus was intact. The clinical picture was not explained by the minute neuroanatomic lesion and only after proper consideration of certain physiologic and psychologic factors could it be understood.

The patient was 17½ years at the time of death. On the third day of life he had a "blue spell." Until the age of 13 years he had about twelve attacks in which he held his breath, became cyanotic and lost consciousness. It was felt that small emotional upsets precipitated the attacks. His thymus was found to be enlarged on X-ray and he was given a total of twenty X-ray treatments, the last when he was 5 years of age. At the age of 5 months another type of attack set in, and the last one of these led to his death. He had had fifteen to twenty of these episodes. The attack was usually ushered in by what seemed to be a rhinitis. He complained of coldness and shivered, sometimes had a chill. The rectal temperature rose to 106 F. during the attacks. Pulse was rapid and BP tended to fall while fluctuating between hyper- and hypotension. After several hours, profuse sweating and flushing of trunk and extremities marked defervescence. During the next few days the temperature was fluctuating with a tendency to return to normal. Pronounced gastrointestinal overactivity and oliguria accompanied the attack. He lost 8 to 10 lbs. in each attack but regained them quickly. His family observed that the attacks always followed excitement or tension. He was always considered to have a degree of muscular incoordination and to suffer from "vasomotor instability." He did not seem able to adjust readily to rapid changes, for example from light to dark. His BP varied greatly throughout life, from 120 to 220 systolic, and with corresponding diastolic.

The authors then discuss the physiology of heat regulation in more detail, in view of the important rôle it played in this case. The part of anterior and posterior hypothalamus in the equilibrium and balanced maintenance of temperature are discussed. In this case the rapid swings in temperature and alterations over a period of days suggest a disturbance between anterior and posterior hypothalamus. The patient had other signs of hypothalamic disturbance both in gastrointestinal and high BP findings.

The boy was underdeveloped bodily and sexually. This, however, may only have been a consequence of the handicaps he was burdened with because of his primary disturbance. It is apparent "that there was a paroxysmal disturbance in the central regulation of body temperature, the circulation, the G-I tract, of respiration and sleep together with a more sustained derangement in somatic and sexual development. . . ." There was anatomically a lesion in the thalamus that interrupted to some degree the connections of the hypothalamus with higher centers and perhaps with lower vegetative centers.

It seems that in this case the lesions acted to interrupt to some degree the higher cortical control of hypothalamic functions. This could lead to overaction of this region to the inflow of afferent impulses, a release phenomenon in the sense of Hughlings Jackson.

Thus stimuli led to caricatures of normal vegetative reactions. The attacks were not spontaneous but all tipped off by situations charged with obvious anxiety or with more subtle situations.

"It is well established that the hypothalamus is the main way station for the autonomic reactions that accompany the expression of emotions." As goal-directed activities they are controlled by the cortex, and in this patient the control was partly abolished.

The patient, as seen from a fragmentary history taken after his death, was exposed to considerable environmental stress of anxiety-provoking character. His family, feeling him as a blow to its self-esteem, could never adjust to this fact. The patient's anxieties were such as to provoke neurotic reactions, even in structurally normal children. Because of this structural lesion the response of the vegetative nervous system to the anxiety was poorly directed and excessive. It tended to be destructive instead of protective. This was true whether the reaction was initiated by psychologic or physiologic factors.

Therapeutically the patient should have been protected from anxiety-producing situations until he might have developed better defenses to handle his disability. The case demonstrates the importance of a liberal and dynamic approach to the interpretation of symptoms. (O.P.)

BIGELOW, N.; GODELL, H.; HARRISON, I., AND WOLFF, H. G.: *Studies on Pain: Quantitative Measurements of the Pain Sensations of the Skin, with Reference to the Nature of the "Hyperalgesia of Peripheral Neuritis."* J. Clin. Investig., 24:503, 1945.

1) The nature and significance of two pain sensations of the skin, "pricking" pain and "burning" pain, have been investigated.

2) The threshold for burning pain is lower than the threshold for pricking pain.

3) The peripheral nerve endings which subserve pricking pain are located more superficially in the skin than those subserving burning pain.

4) During the phase of incomplete analgesia following infiltration of procaine hydrochloride into the skin or chest, a peripheral nerve pricking pain is perceived whereas burning pain is abolished.

5) Pricking pain is the first or fast pain perceived in the double response to pin pricks; burning pain is the second or slow pain.

6) Ischemic block of an extremity initially lowers the thresholds of pricking and burning pain. The threshold for burning pain is more depressed and exists for a longer time than the threshold for pricking pain. During the threshold period of depressed burning pain the sensation of burning pain long outlasts the noxious stimulus. Prolonged ischemic block produced an elevation of both pricking and burning pain thresholds and ultimately complete analgesia.

7) The hyperalgesia associated with peripheral neuropathy in patients may be explained by the significant depression of the burning pain threshold. This is usually accompanied by an elevated threshold for pricking pain.

8) These experiments together with the work of others make it seem likely that burning pain is conveyed chiefly by unmyelinated and pricking pain by myelinated fibers.

The method used in the experiments was as follows: the light from a 1000 watt bulb was focused on a blackened skin, 3.5 cm² in area. An automatic shutter was used to allow the light to fall on the skin for a measured period of time. The subjects were instructed as to the nature of burning and pricking pain and were given no additional information, in order to avoid suggestion. (O.P.)

FRIEDMAN, M.: *Studies Concerning the Aetiology and Pathogenesis of Neurocirculatory Asthenia (NCA)*. III. *The Cardiovascular Manifestations of NCA*. Amer. Heart J., 30:478, 1945.

As a result of previous studies in NCA, attention was directed towards the hypothalamus as a possible factor in the pathogenesis of the somatic phase of the illness.

An attempt was made to investigate the physiologic connection between the admitted emotional turmoil of the patient with NCA and his cardiovascular symptoms and signs by a study of 50 young soldier patients suffering from NCA. The intimate connection of the cardiovascular system with the remainder of the body and the inaccuracy of studies of isolated hemodynamic functions are stressed.

On physical and X-ray examination no significant deviations from the norm were found. The EKG also showed no significant deviation, although in 22% of the cases transient arrhythmias were seen. In 2 patients with paroxysmal tachycardia, the arrhythmia

was preceded by marked accentuation of hand tremor, elevation of the oral temperature to hyperthermia, perspiration of axillary and palmar skin, facial pallor, and a feeling of nervousness or tension. Quinidine suppressed the tachycardia, but not the other symptoms.

This suggests that the tachycardia is not the cause of the other symptoms but is caused together with them by the peculiar nervous discharge preceding and accompanying it. After exercise (voluntary tachypnoea and hyperventilation) the pulse rate went up, but the objective assessment of cardiac efficiency showed no significant changes. A simple exercise (lifting an 8 lb. weight 10 cm. 50 times over a pulley and cord arrangement) caused no significant changes in the cardiac output, if the element of anxiety was taken into account. Fraser and Wilson wrote in this connection: "These patients seem to differ from healthy men only in that a stimulus such as excitement or emotion produces an unusually large response." Jones and Lewis observed: "—it is not the effort but the situation in which effort may be required and the emotional attitude of the man toward the situation that are often the significant factors." The author agrees completely with this opinion. Although a high percentage of the patients with NCA complained of respiratory distress even after slight exertion, it was seen that they did not experience dyspnoea sooner than the control patients, if the anxiety factor was excluded. Precordial pain appeared in two types. Sharp stabbing pain, not lasting longer than five minutes, is accompanied by arrhythmia or pounding heart. In addition, there are signs of a nervous discharge, strongly suggestive of the sympathetic nervous system. In these cases the pain seems to be cardiac and passes after the cardiac condition has improved.

The other type of pain is longer lasting, in a wider area around the nipple and seems to originate (Wood) from respiratory dysfunction. Some patients had both types of pain. Ninety-four per cent stated that they had had bouts of palpitation. As a transient condition 92% of the patients exhibited changes in temperature and color of the extremities.

Many observers have been impressed by the striking similarity of many manifestations of NCA with those following an excitation of the sympathetic nervous system. In order to investigate the rôle of the autonomic nervous system, drugs were used on NCA patients.

1) Epinephrine 0.5 mg. produced about the same changes in the NCA patients and in the controls.

2) Physostigmine 1.0 mg. im. The impression was that the NCA patients were not unduly sensitive to this cholinergic drug.

3) Atropine 1.5 mg. s.c. did not indicate that a previously increased parasympathetic discharge was present in these patients.

4) Scopolamine 0.6 mg. s.c. caused disappearance of coldness of extremities. Otherwise no changes were seen.

5) Caffeine 500 mg. orally showed a marked effect

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in the NCA patients. There was an average increase of 16 heart beats and 6 respirations per minute. The hands became wet and cold. The heart pounded more forcefully. No changes were observed in controls.

6) Benzedrine showed increase of about 16 heart beats and 7 respirations per minute. Sweating increased and the hands became wet and cold. Two patients exhibited purplish mottling of the skin of their extremities.

"From the preceding observations it must be assumed that the heart of the patient with NCA is basically sound both in structure and function. If, occasionally at rest and always during effort associated with emotional activity, this type of patient experienced dyspnoea, palpitation and precordial pain, and exhibited tachypnoea, forceful beating of the heart, arrhythmia, and coldness of the extremities, there was sufficient evidence also that these cardiovascular signs and symptoms were preceded or accompanied by a nervous discharge, which seemed to bear a causal relationship to the onset of the cardiovascular dysfunction observed."

"Thus it was found that the real mechanism . . . was the episodic, frequently spontaneous occurrence of this nervous discharge." From clinical and experimental evidence this discharge appears to be sympathetic in nature. In the NCA patient the peripheral part of the sympathetic nervous system is not unduly sensitive. Production of the same type of nervous activity by emotions, caffeine and benzedrine (acting on the higher centers) indicates stimulation at the central point. The hypothalamus has been described as the locus of this point, and it would appear that this portion of the brain was unduly responsive to emotional activity or to administration of the drugs mentioned. The hypothalamus is believed to be responsible for the emergence of the somatic manifestations seen in NCA.

"It should be pointed out in this connection that NCA is intimately associated with emotion and the latter in turn has a close relationship with the hypothalamus." (O. P.)

HILL, J. G. W., AND DEWAR, H. A.: *Effort Syndrome*. Lancet, I:161, 1945.

Four hundred and eighty-nine cases of functional cardiac disorders have been analyzed from the clinical point of view. They fall into three groups:

- 1) 50 cases seen in Britain from March 1940 to June 1940.
- 2) 241 cases seen in the Middle East from January 1941 to September 1942.
- 3) 101 cases seen in Britain from February to September 1943.

Group 2 consisted mainly of physiologically-fit soldiers, while in group 3 there were many men from labor corps, conscriptees, etc.

Frequency: In comparing statistics, it is seen that in this war the frequency is very much reduced from the last war.

Duration of Symptoms: In series 3, 37% had symptoms for ten years or more. In all three series, 54, 29 and 58% respectively had them for more than three years. In most of these the onset had antedated their entry into the service. (The condition is familiar also among civilians. At Edinburgh Royal Infirmary, in an investigation of ischaemic cardiac pain, some 150 cases of pain with effort syndrome were collected with 200 cases of coronary thrombosis and about 250 cases of true effort angina.)

Age and Physique: The proportion of older men affected rises with increase in the average age of those at risk. A high percentage of those affected was interested, or even excellent, in some type of athletic activities.

Remote Previous Illness: Serious or protracted illness in early life had often been the starting-point of a life-long conviction of physical inferiority. Medical warnings against "strain," or exposures to the hazards of ordinary school life, and anxiety and overprotection on the part of parents had played a large part in developing such an attitude of mind. There is a high incidence of rheumatic disease (15 to 32%) and also other serious non-rheumatic diseases (12.4 to 30%) in childhood.

"Doctor Made" Cardiac Neurosis: One-third to one-half of the cases were told by a doctor that their hearts were abnormal. Grave decisions as to the patients' regime, change of occupation, etc., were considered in connection with possible severe repercussion on their nervous and emotional state.

Precipitating Factors: In 5 to 10% of the cases the onset was related to battle experiences, bombing, etc. Another 10% was traced to anxiety states. About the same percentage related the onset to a single act of physical strain. In about one-third of the cases no provocative strain could be found. It seems that army life had unmasked rather than provoked the disability in many cases.

Multiplicity of Aetiological Factors: Many cases showed several factors. "The unravelling of the tangled case history in even the simplest case demands the expenditure of time and the exercise of tact and patience."

Associated Organic Lesions: Only a few cases had clinical evidence of coexisting organic heart disease. Some had mild thyrotoxicosis.

Breathlessness: This may be the patients' expression for tightness in the throat or choking sensations. Often it is due to a deep, jerky inspiration during normal breathing. Their breathlessness can be distinguished from organic heart failure by the absence of other signs.

Pain: This may be confused with consciousness of heart action or palpitation, but actual pain is frequent too. Mostly it is suffered around the left nipple. Substernally it is very rare. Stabbing pains are of short duration, while vague diffuse pains may persist for hours. The pain of effort syndrome simulates that of true angina pectoris.

Faintness and Tiredness: Complaints are frequently encountered, having their origin in association with heart disease in the patients' minds.

Physical Signs: Overactive heart action is often found. Occasionally sinus arrhythmias are encountered. The BP is usually high and unstable. Generally the physical signs resemble thyrotoxicosis, except for the cold sweating of the extremities instead of the warm flushed skin in the thyroid condition.

Emotional State: There is often a gross anxiety status. But even with no overt anxiety the mentality is quite typical. They are childish, dependent, anxious, emotional, and introspective. They are either timid or aggressive, and lacking in self-confidence.

Prognosis: "Long history and increasing age, deep-seated conviction or fear of heart disease, and breakdown under non-strenuous conditions (inadequate type) were of bad prognostic significance. As a rule, men in whom the circulatory symptoms were only a small part of a generalized anxiety did not respond at all to the physical rehabilitation."

Principles and Methods of Treatment: The first step was reassurance given authoritatively after a thorough physical examination. Thereafter no additional medical examination was done, not even pulse counting. Also on discharge no physical examination was done. The treatment consisted of gradually increased exercise with increased privileges. Cases that failed to progress after one to two weeks were referred to the psychiatrist, evacuated or discharged.

Results of Treatment: About 50% were discharged fit for useful service after purely physical rehabilitation and reassurance.

Forty-two and five-tenths per cent were transferred to the neuropsychiatric service. In a later follow-up, (9 months) which included the patients referred to the psychiatrist, over 80% were on full or light duty. (O.P.)

FRIEDMAN, M.: *Studies Concerning the Aetiology and Pathogenesis of Neurocirculatory Asthenia (NCA)*. II. *The Mechanisms underlying the Giddiness Found in Patients with NCA*. Amer. Heart J., 30:325, 1945.

The investigation is based on the clinical study of 41 soldiers suffering from NCA. Their average age was 26 years. The author concludes . . . "that temporary and intense pulmonic and systemic vasoconstriction observed during the Flack test was due to a fundamental hyperirritability of the cardiovascular system of the patient to slight changes in the flow or pressure of venous blood returning to the right auricle—changes which in the normal individual evoke only slight and physiologically commensurate readjustments in the cardiovascular system."

In a previous article, the hyperthermia present in many NCA patients was described. It was deduced that the hypothalamus was affected in some way. In this present study the conclusion is drawn on the basis of the profound and generalized vasoconstriction

always found, that the sympathetic nervous system was hyperirritable or deranged in the NCA patient. It is suggested that the hypothalamic region may be involved since the main coordinating center of the sympathetic nervous system is located there. (O.P.)

SARGENT, W., AND SHORVON, H. J.: *Acute War Neuroses: Special Reference to Pavlov's Experimental Observations and the Mechanism of Abreaction*. Arch. Neurol. and Psych., 54:231, 1945.

Sargent and Slater have already reported on the acute neurotic casualties from Dunkerque and suggest that a process resembling conditioning was seen in these patients in a simple form, and that the success of physical methods of treatment indicated that physiological processes played a considerable part in the development of an acute neurosis. They also described the good effect of emotional abreaction from intravenous barbiturates.

The authors and their associates have treated some 10,000 neurotic war casualties and in this paper are reexamining them in the light of Pavlov's theories. According to these, the unconditioned reflexes are concerned with food, defense, sex, and other fundamental drives. Their anatomic center is in the sub-cortex or basal ganglia. The cortex synthesizes and analyzes external and internal stimuli, and conditioned temporary reflexes are formed and conducted along special paths. According to Pavlov there is a third system, genetically the youngest, located in the frontal region, which subserves abstraction and speech. This is the most easily disturbed system in mental disorders.

Pavlov formulated a series of laws governing the phenomena of excitation and inhibition—their irradiation, concentration, and mutual or reciprocal induction. When the limit of a stimulation is exceeded, a temporary inhibition follows. In this phase a strong stimulus produces a weak or no response. This is the paradoxical phase.

On the basis of his experiments Pavlov classified the types of nervous systems of his dogs in a way similar to Hippocrates' system of temperaments. He expressed the belief that a morbid state could be brought about by very strong stimulation, either excitatory or inhibitory, or by a "collision" of both. The direction of breakdown depends on the form of stress and type of the nervous system. By these means he tried to explain the symptoms of neuroses in man, such as hysteria, obsessional states and paranoid ideas. The phenomenon of the "equivalent," "paradoxical" and "ultraparadoxical" phases are of particular significance in this discussion. If stimuli are more intensified after the paradoxical phase has been reached, an inversion takes place and instead of stimulation, inhibition or exhibition takes place. Pavlov calls such stimuli "trans-marginal stimuli" and the inhibition thus caused is "ultraboundary stimulation." Once produced it may spread quickly over the whole cortex and stop its activity.

The authors compare Pavlov's experimental results with their clinical results and use Pavlov's concept for the interpretation of most types of reaction. Somewhat more difficult is the explanation in a small group of an acute schizophrenic-like syndrome, believed by the authors, on clinical grounds, to be an unusual hysterical-like reaction. The response to different types of treatment is discussed. In less severe cases heavy sedation and rest was used. Abreaction with narcotics such as barbiturates, ether, sodium amytal was used. In certain cases when the response was unsatisfactory, it was combined with therapeutic convulsions. Psychoanalysts have suggested that therapeutic convulsions are a form of abreaction.

Apparently the skill of the physician plays an important part in the success of the type of therapy used. Henderson and Gillespie summarized their view on narcoanalysis as follows: "It is extremely likely that what really is effective in this situation is the doctor's confidence in the treatment."

Seven case reports are attached to illustrate the points discussed in the paper. (O.P.)

ROPES, H. W., AND BAUER, W.: *Rheumatoid Arthritis: Its Varied Clinical Manifestations*. New England. J. Med., 233:592; 233:618, 1945.

The many types of onset and course make it often difficult to recognize rheumatoid arthritis. Often prodromal symptoms of fatigability, anorexia, weight loss, vague muscle and joint aching may precede joint manifestations by months or years. As predisposing factors are given infections, accidental or operative trauma, physical or emotional strain.

Eleven case histories are reported as examples of the different variations. There is a high incidence of some type of joint disease in childhood, of pseudoheredity and of emotional strain as precipitating factors. The treatment of rheumatoid arthritis as a chronic disease requires a different point of view from the physician as well as from the patient. No dramatic sudden changes should be expected and there must be an appreciation of the treatment in all its parts for the final outcome.

"Proper treatment of rheumatoid arthritis necessitates even more consideration of the patient as a human being than is necessary in acute diseases. Attention must be given not only to the many psychogenic factors that played a role in the precipitation and progress of the arthritis but also to the various problems produced by the disease. There must be a realization that whatever emotional instability previously existed is increased by the illness. . . . An attempt must be made to understand what the patient thinks about the disease, to be aware of and lessen his fear of it, and to increase his insight into the effect of psychogenic factors on the course of the disease." (O.P.)

ZIWER, M.: *Aggression and Intercostal Neuralgia. A Psychosomatic Study*. Egypt. J. Psych., 1:1, 1945.

A man, under psychoanalytic treatment for sexual inhibitions, developed an intercostal neuralgia on the right side of the thorax. It was regarded as a psychosomatic syndrome in view of its clinical aspects and the psychoanalytical investigations. The patient, aged 30, physically perfect, of superior culture and intelligence, had married three years previously for convenience. His wife, mediocre in all respects, did not attract his interest. Shortly after marriage he met another woman of great refinement, who accepted his proposals. But from the very beginning he was impotent and became deeply depressed. The dissociation between the tender and sensual component of love, as described by Freud, is quite evident here.

In spite of his intelligence he could not perceive that his impotence had psychic causes, although he had never experienced it with his legitimate wife. He underwent, therefore, a series of organic treatments for over two years before resorting to psychotherapy.

His relations to his mistress continued despite his impotence. After eight months of his treatment he had worked through his Oedipus complex and saw his mistress' role as "mother surrogate," his hostility against his father and his castration complex. In consequence he improved unmistakably, interestingly enough, to the displeasure of his mistress. The patient noticed that she became nervous and maneuvered so that he might relapse.

During this period the patient complained in a session, after two days' absence, of an acute pain in his right hypochondrium. It began as a stab ("coup de poignard," was his expression since the analysis was conducted in French) when he was lying face downward in a forced position, nailing a tent on the top of his sea-bungalow. The pain became more severe, and when he saw a physician a liver disease was diagnosed and he was put on a strict diet. His resistance expressed itself in his remarking sarcastically that the psychotherapist would probably try to find psychological factors as a reason for his symptoms. This was explained to him and the session continued with vehement attacks of the patient against his mistress and her vexing provocations. He made two slips of the tongue. First he stated that she was waiting a "coup de p . . ." correcting it immediately to "coup de telephone." He had formerly used the expression "coup de poignard" for his pain. He then corrected the sentence that it was he waiting for her call, not she for him. After this he stated this spontaneous idea: "Eve came out of one of Adam's ribs, right from where I am now suffering." Another physician, to whom the patient was referred, established the diagnosis of intercostal neuralgia.

In the next session the patient reported the following of dream. He was assistant to his professor at a

place which reminded him of both where he got his higher education and where he first met his mistress. There were the priests owning the place, preaching but remaining in the background. A worker pierced the wall (*eventrer le mur*) between corridor and hall. The worker told the patient that he was to put a mirror in the wall on order of the Pascha, in place of the pierced piece of wall. The patient left, and to his amazement, his car was parked parallel to the pavement, not perpendicularly as he had left it. The patient recognized in the Pascha authority as especially paternal, *i.e.*, categorical and imperative. The worker reminded him of the day he first felt the pain. He expressed resentment against his mistress at this point. The mirror reminded him that on the previous day he wanted to fix a mirror in the room where he met his mistress, but had forgotten to bring screws. He remembered that he and his mistress had recently stood in front of the mirror looking at themselves. The car had previously often appeared in his dreams as a symbol of the penis and the meaning of its standing parallel to the pavement was readily recognized, in terms of his still persistent occasional sexual inhibitions.

The worker in the dream is the patient driven by his sadistic impulse against his mistress. The word "eventrer" is suggestive in itself. But a mirror was to be placed in the wall, an object reflecting the rays falling on it. The aggressive act should therefore return to the aggressor himself. Aggressiveness is attached to the sexual act (*cf.* "eventrer," the wall behind corridor and hall). The car parked parallel to the pavement had the meaning that inhibition of the sexual act should restrain aggression.

The hammering of the nails obviously represents, symbolically, an aggressive sadistic act against his mistress. The pain felt at that moment represents the rebound of the aggressive act upon its doer, although the patient probably attained some satisfaction from the original aggression through identification. The association between the intercostal pain and the origin of Eve from Adam's rib favors this hypothesis. Furthermore, at a previous occasion the patient had developed some somatic symptoms shortly after his mother had developed some of the same nature. This would favor the assumption of his identification with his mother and later with her substitute.

A dream brought in the next session is of much significance. He was responsible for a group of people. A man was lying down, "exactly as I am now," when he was stabbed by a person familiar to the patient. The aggressor tried to hide the instrument. "I was about to say the penis." Finally it was found that it was his mistress who was stabbed.

The painful syndrome diminished in intensity after three sessions and completely disappeared within one week.

The fact is stressed that the pain was real and apparently represents a conversion process in the sense of Freud. (O.P.)

SILVERMAN, J. J., AND POWELL, V. E.: *Peripheral Vascular Changes in Dermatomyositis*. *Amer. Heart J.*, 30:441, 1945.

Dermatomyositis is rare and often goes unrecognized. In the classification of the American Heart Association it has been omitted. There seems to be a lack of unanimity in regard to what is represented by dermatomyositis. Clinically, dermatomyositis, scleroderma, disseminated lupus erythematosus, Libman-Saks syndrome, and periarteritis nodosa seem at times related, and there may be a common denominator. A history of Raynaud's Disease was observed in many patients by Jasper and Grossman.

To illustrate the syndrome, a case of a 35-year-old Jewish soldier is reported. He was stationed in a South Pacific area and, after previously having been in good health, developed a vascular and papular eruption on hands and feet. He gradually developed weakness, abdominal pain, vague aches and pains in most of his muscles, cramps in his legs on walking, and "nervousness." After a year he developed an ulcer on the tip of the middle finger on his left hand, which was refractory to treatment. He was evacuated to the U. S. with the diagnosis of dermatitis of unknown origin and psychoneurosis.

Clinically the peripheral vascular manifestations were suggestive of thromboangiitis obliterans. However, as seen from a biopsy, none of the characteristic endothelial changes were seen. Mild leucocytosis and fever suggested periarteritis nodosa. Again, the pathology seemed more in the nature of an infiltration without the necrosis seen in periarteritis. Biopsies from muscles showed signs of myositis. The authors suggest in conclusion that dermatomyositis be regarded primarily as a vascular disease. (O.P.)

WILBURNE, M.: *Transient "O" Diastolic Brachial Pressure (Indirect) Associated with Normal or Elevated Popliteal Pressure, Tachycardia and Nervous Tension*. *Amer. Heart J.*, 30:381, 1945.

A new syndrome was observed in 38 inductees with marked nervous tension. In addition to the nervous element, the syndrome was characterized by transient "O" diastolic brachial pressure (indirect), normal or elevated popliteal pressure and tachycardia. The brachial systolic pressure associated with the diastolic "O" pressure was between 118 and 250. The popliteal averaged 202.3/101.9. Heart rate ranged from 90 to 168. The possible mechanisms leading to the syndrome are discussed. Clinically it is important to distinguish this syndrome from true aortic insufficiency. The "O" diastolic pressure probably presents only a low diastolic but not a true "O" diastolic pressure. (O.P.)

LEVINE, L. A., AND HINDLE, J. A.: *Coronary Artery Disease Among Physicians*. *New Eng. J. Med.*, 22:233, 1945.

From a statistical study, the authors conclude that the life of a physician is not conducive to coronary

artery diseases and that the incidence of this disease among physicians is no greater than among the general population, for both groups die at the same average age.

That the average age of death from coronary disease is much lower in Jews than in Gentiles is to be related to the fact that the average age of this group is much lower altogether. It was found that the average age was lower among smokers as compared to non-smokers. (O.P.)

PATERSON, M. T.: *Spasmodic Torticollis. Results of Psychotherapy in 21 Cases.* Lancet, 249:556, 1945.

The literature on etiology, classification, pathology, and treatment of spasmodic torticollis is given briefly. Among 2500 cases of all kinds of psychoneuroses admitted to Jordanburn Hospital there were 21 cases of spastic torticollis. Of those, 18 were considered to be of psychogenic and 3 of possibly organic origin. There was a high incidence of neurotic traits.

The psychotherapy consisted of an attempt to correct faulty emotional reactions and attitudes by giving the patient insight in the way his torticollis had arisen. In less intelligent patients resource was made to suggestion. The influence of suggestion was much enhanced by inducing a mild hypnotic or narcohypnotic state. (O.P.)

HAWIRKO, L., AND SPRAGUE, P. H.: *Treatment of Obesity by Appetite Depressing Drugs.* Can. Med. Assn. J., 54:26, 1945.

One hundred and sixty-two cases of obesity were treated with a combination of diet and medication. Benzedrine sulphate up to 15 mg. and salyrgan were used. Where benzedrine caused too much excitement and insomnia, it was substituted by amphetamine, starting with 2.5 mg. two to three times a day. Where salyrgan was given over a longer period, calcium lactate was given (10 gr. t.i.d. after meals), because mercurial diuretics together with restricted diet may cause a calcium depletion. The diet was on the basis of 1100 cal. a day and vitamins in the amount of the daily minimum requirement were added. Patients with a BMR of O or lower were also given 1 gr. of thyroid a day.

The benzedrine has two effects in the treatment of obesity. First, the appetite is decreased. Secondly, the desire for activity is increased (Eggleston and Weiss). It also may act as a diuretic, according to Rosenthal and Solman.

"Lesser and Myerson claim that in some cases obesity may be the result of an upset of appetite-regulating mechanism, caused by a dissatisfaction with life and a consequent defect in mood. In such cases nibbling of food as a means of satisfaction and compensation for the disturbed mood may occur. This does not constitute true hunger. Benzedrine, by alleviating fatigue and improving the state of mind, can often reduce the desire to eat."

It is very important to encourage the patient and to convince him that his obesity is due to overeating and bad eating habits, and not to glandular disturbances. A good stimulus in this regard is the initial weight loss caused by the use of salyrgan. (O.P.)

WALSHE, F. H. R.: *On "Acroparesthesia" and So-Called "Neuritis" of the Hands and Arms in Women.* Brit. Med. J., I:596, 1945.

The syndrome of acroparesthesia, which is peculiar to women engaged in manual work when they are debilitated or fatigued, and usually when they are in their middle age, is considered as a manifestation of a rib pressure syndrome. It consists of numbness and tingling, later of paresthesia and pain in the hands and digits. The rib in question is the normal first rib, and traction and compression are exerted on the lower components of the brachial plexus and sometimes also upon the subclavian artery when the muscles supporting the shoulder girdle, being atonic, allow it to droop and to sit at an abnormally low level. In short, acroparesthesia is a mechanically produced syndrome.

There is no evidence available for regarding it as dependent upon abnormalities of metabolism either toxemic or due to dietary deficiency—or as standing in any specific relation to pregnancy per se. (O.P.)

PEBERDY, G. R.: *Acroparesthesia.* Brit. Med. J., I:820, 1945.

The writer submits a few points of difference and amplification to the previous article. He states that the syndrome is not confined to women. It may undergo remission without physical environmental changes. He discusses critically other points brought forward by Walshe and, concluding, reports:

"In the past month I have met typical bilateral manual acroparesthesia in a young R.A.F. officer of powerful physique, whose cervical thoracic area showed no x-ray abnormality and who had been doing no heavy manual work. He passed through an emotional disturbance of considerable magnitude, after a certain phase of which his acroparesthesia disappeared. . . ." (O.P.)

MARTIN, C. P.: *Religion and Medicine.* Can. Med. Assn. J., 54:53, 1945.

The author stresses that he can express only his own views since there is no common ground of generally accepted concepts, and viewpoints vary from the purely materialist to the Christian with all variations between.

There are three questions on which religion and medicine meet. First, what is the basic assumption underlying all medical work. Secondly, there is the question of faith-healing and miraculous cures. Thirdly, there are the aspects of modern psychiatry. In the latter there seems to be the greatest interest at the present.

As to the first question, medicine and religion agree that human life in itself is worth preserving.

There is a difference of opinion as to the second question. Medicine recognizes the power of prayer and thus confidence in the service of recovery. To the Christian, however, prayer is invocation of a foreign power that may manifest itself also in the physician. This idea is not acceptable to the physician, just as the idea of trickery and suggestion caused by it is unacceptable to the Christian.

"Psychiatry has shown that particular mental states can cause, or at least be a predisposing factor, leading to an actual physical lesion. In other cases symptoms may arise, simulating closely organic lesions, and in others behavior changes may take place."

The psychiatrist treats these states by a series of empirical treatments not well understood in their mechanics (shock, narcosis, etc.) and by psychotherapy, mainly concerned with explaining the patient to himself. If this is done on a superficial level, no conflict with religion arises. But in cases where the psychiatrist has to go further, he steps into the realm of philosophy or religion. C. F. Jung stated that: "Among all my patients in the second half of life, that is to say over 35, there has not been one whose problem in the last resort was not that of finding a religious outlook on life." In his dealing with the patient the psychiatrist will always reflect his own outlook on philosophy and religion. If, for example, a man after several years of happy marriage is unfaithful to his wife, his brooding about his sin may result in many things. He may project to and become resentful of his wife. Or he may develop bodily symptoms. The psychiatrist can perhaps explain the situation to the patient and leave him, with the help of his own minister, to find his way out of the situation. Or he himself may explain things, perhaps by telling him that the guilt comes from his own vanity, that he tries to set himself above the plane of his fellows and that he has to reconcile himself to the lower plane of common human nature. He will try thus to relieve the guilt feelings of the patient.

The Christian admits that this way of dealing with the problem is not too difficult and mostly successful. But he denies that this is the right way because it solves the conflict by killing the moral sense of the patient. The Christian believes that it should be resolved by conquering not the moral sense but the sin. The other way he regards as a narcotic that eases the pain while it encourages the underlying moral cancer. Some, perhaps only an unconsiderable minority, among psychiatrists are Christians. Most belong to no definite religious group. The author understands the word Christian to mean the believer in Christ the Saviour. Many people are using the word Christian in the sense of "decent fellow."

The Christians claim that they do not trespass on the realm of psychiatry but that the psychiatrists trespass on that of religion.

Some quotations from Chisholm and Hargreaves are made that seem to point out this view. On the other hand, religion could be taken to task for its failure to keep its promise to give human security, the one thing every one is trying to achieve in the end. (O.P.)

WATTS, G. O., AND WILSON, R. A.: *A Study of Personality Factors Among Venereal Disease Patients*. Can. Med. Assn. J., 53:119, 1945.

A survey was made of 292 V.D. patients, using 158 soldiers selected at random from a group of consecutive files for controls. The percentage of men under 22 is 15% higher in the control group than in the V.D. group. This would suggest that V.D. occurs less easily in recruits up to 22 than in the older age group.

The main predisposing personality traits among V.D. patients were found to be related to the following:

- 1) Unstable men without any self-control (psychopathic personalities).
- 2) Heavy drinking.
- 3) Promiscuity and immaturity of attitude and behavior (high divorce rate).
- 4) Mental dullness.

The disease frequently was precipitated by the following factors:

- 1) Assignment to work not liked.
- 2) Punishment for a crime also committed by others who were fortunate enough to escape punishment.
- 3) Quarrels with wife or girl-friend.

"The spectacular success of penicillin . . . has led some medical men to conclude that the V.D. problem has been practically solved. . . . However, curing an urethral discharge or penile sore does not influence immature habits of behavior which contribute to the acquisition of V.D." (O.P.)

STOLZ, G. O.: *The treatment of Asthma*. Can. Med. Assn. J., 53:482, 1945.

Asthma is divided into seven groups according to the severity of symptoms and organic changes.

The treatment depends upon the group classification and consists in increase of general resistance, drugs (aminophyllin, adrenalin), desensitization, and auto-vaccination. These are done also for increase of resistance. Psychogenic factors are considered influential, especially in younger individuals. (O.P.)

Revista Argentino-Norteamericana de Ciencias Medicas.

This South American medical journal, now in its third year, gives the reader an excellent impression both from the point of view of content and format. The purpose of this journal is to further the easy exchange of new medical knowledge between North and South America. The journal is a monthly publication, edited in Buenos Aires, Ayacucho 576. There are original articles from both North and South American authorities. The journal is not oriented towards any one specialty, and research, theoretical and practical fields are given equal consideration. There are extensive abstracts in the English language at the end of each article. Considerable space is given to reviewing new books from both parts of the hemisphere. It offers physicians here a good opportunity to keep abreast of medical writing in Latin America. Because of its general interest in all fields of medicine and its progressive tendencies in regard to new developments, the journal should be of profit to physicians interested in psychosomatic medicine. (O.P.)

BOOK REVIEWS

The Yearbook of Psychoanalysis. Volume I. Edited by Sandor Lorand, A. A. Brill, Henry Alden Bunker, Bertram D. Lewin, C. P. Oberndorf. New York, International University Press, 1945.

This volume, first of a series to be published annually, was initiated by Sandor Lorand. This edition, however, contains several papers published over a year ago, while in the future selections will be limited to the current year.

For the psychoanalyst, the physician interested in psychiatry and psychosomatic medicine, and for the layman these papers give an excellent perspective of dynamic psychoanalytic development.

The selection covers a broad field of topics. Freud is represented by a paper written in 1923 and translated in 1943. The paper by Hans Sachs, "Community of Day-Dreams," is a psychoanalytic classic worth reading and studying regardless of the year of its publication.

A considerable part of the yearbook is devoted to papers concerning psychoanalytic principles and theories. The most outstanding contribution is by Ernst Simmel, "Self-Preservation and the Death Instinct." A summary of present trends in psychoanalytic theory and principles is given in the form of a symposium by Gregory Zilboorg, Robert Waelder and Karl Menninger. Ernest Jones defines the "Normal Mind"; Siegfried Bernfeld gives a remarkably clear analysis of Freud's early theories and the school of Helmholtz.

The more clinical part of the book is represented by Helene Deutsch, who writes about the relationship of certain emotional disturbances to schizophrenia. There is a short but stimulating and thoughtful paper by Ruth Mack Brunswick entitled "The Accepted Lie." A symposium on sleep disturbances by Fenichel, Windholz, Olden, Deri, Maenchen, Berliner, and Simmel concludes the clinical contributions.

Recent issues of war psychiatry are discussed in Sandor Rado's brilliant paper, "Pathodynamics and Treatment of Traumatic War Neuroses." It is followed by two papers which look strangely out of place in the yearbook: Charles Anderson, in his paper "Homosexual Responses to Warfare," skillfully avoids any of the underlying problems of this important subject. Elisabeth Rosenberg's remarks about war neuroses offer very little new insight. It is unclear why these two papers were chosen to represent the many and excellent contributions of psychoanalysis to the understanding of traumatic neuroses.

Students of psychosomatic medicine will find two excellent contributions: Franz Alexander's fundamental discussion of "Concepts of Psychosomatic Research: Psychogenesis, Conversion, Specificity" and a reprint of Flanders Dunbar's introduction to her book, "Psychosomatic Diagnosis."

A bibliography by Sandor Lorand, listing 150 titles and covering the field of psychoanalytic contributions to the problems of alcoholism, forms the last chapter in the yearbook.

The first volume of the yearbook sets high standards for the volumes to follow in the future. It is both a textbook and a book of reference of current trends in analytic research. It is broad in its scope, undogmatic in its selection, and will be welcomed by everybody seriously interested in scientific progress and psychiatric education.

MARTIN GROTJAHN

SARGENT, W., AND SLATER, ELIOT: *An Introduction to Physical Methods of Treatment in Psychiatry.* Edinburgh, E. & S. Livingstone, Ltd., 1944, 171 pp.

This book is addressed to young psychiatrists, students and internists. Its theoretical bias is expressed clearly in the preface and introduction. Therapy in psychiatry is looked upon as only ten years old (p. VII). The "psychotherapeutic and psychoanalytic school" (whatever this means) are granted only a few saving graces (p. 1). In the genesis of mental ills, major emphasis is placed on the role of "inherited potentialities"; while the specific "griefs and hardships of every-day life" are held to be relatively unimportant. On page 5 *arteriosclerosis* is said to show "a slight" shift to primitive levels with "consequent crude hysterical conversion symptoms." On page 7 one finds references to "inherited tendencies to dementia praecox, involutional melancholia and senile dementia." The complex problem of vulnerability to combat neurosis is disposed of by stating that "the men who broke under severe stresses of war" showed "emotional immaturity, constitutional anxiety" and "feeble, fragile, unstable personalities." Again, on page 10, it is stated flatly that in the genesis of all mental ills "it is the constitutional make-up that predominates." Nowhere is there any consideration of the basic problem of how to differentiate between symptoms that might accurately be looked upon as manifestations of defective "constitution" and the unresolved residues of the neuroses of childhood.

In the section on the approach to "rational" treatment there is a sound exhortation to institute active treatment early, so as to avoid the chronicity which may develop even in essentially recoverable illnesses. It soon is evident, however, that this sound principle is applied only to support the early application of varieties of physical treatment.

Chapter I (p. 16) deals with insulin treatment for schizophrenia. A three-to-one ratio is claimed for the frequency of improvement in schizophrenics treated by insulin as compared to other methods. This is in contrast to more critical reports from other sources. In the recommended routine of treatment, the authors indicate that widely varying doses are used. Some patients seem to "need" sub-maximal coma, and some deep and prolonged coma. This parallels an argument over the relative merits of superficial versus deep psychotherapy, the argument itself constituting an unwitting admission of the lack of the very specificity which is claimed for insulin. Subsequently, on page

39 it is argued that the need for psychotherapy to supplement insulin treatment is "exaggerated," apparently because prodromal life problems are interpreted as the early symptoms of the illness itself. Why this argument is not equally valid in the problem of constitution (*i.e.*, why those early difficulties which are taken as indicating the presence of constitutional defects are not merely the early symptoms of unresolved neuroses) is never discussed.

Chapter II, on modified insulin, resurrects Weir Mitchell, claiming that the validity of this approach has been confirmed "by experience in the war" (p. 43). Here again, however, the argument becomes inconsistent with the basic premise, in that the claim is made that modified insulin is valuable primarily for "the chronic neuroses who have a good personality." It is difficult to reconcile this clinical entity with the previously expressed point of view on constitution.

A period of continuous sleep under sedatives is recommended before the use of modified insulin for "hyperacute anxiety" and severe hysterics. In severely agitated or retarded depressions convulsive therapy followed by modified insulin is advocated "if needed." Modified insulin is also recommended in post-concussional disturbances in which organic and psychogenic forces both play a role.

On page 50 the basic argument recurs: "Not infrequently, however, with the neurotic as with the schizophrenic, it will be found that the immediate apparent precipitating cause fades into insignificance as improvement occurs, and that what the patient took to be the reason for his breakdown is merely a premonitory sign of its imminence."

In evaluating the results of treatment (p. 50) the authors again resort to ad hoc reasoning. A failure to gain weight under modified insulin becomes a reason for changing diagnoses, *e.g.*, from "neurosis" to "reactive depression," or to "endogenous depression." At the same time it is acknowledged that there is no correlation between gain in weight and improvement in the neurosis itself. Here the inference is conveniently drawn that the ungrateful neurotic who gains weight but whose neurosis does not improve must have had "a poor personality."

In Chapter III, on convulsive therapy, the conclusion is reached that convulsive treatment is valuable primarily for depressive states and in active disturbances of affectivity, whatever the setting. Convulsive treatment is contraindicated in anxiety states and in obsessional-compulsive states. It is frequently well to follow convulsive treatment with modified insulin.

Chapter IV is devoted to the problem of cerebral dysrhythmia. The existence of a dysrhythmia is taken as evidence for a dysrhythmic constitution (p. 73), which "when they break down" produces epilepsy and epileptoid behavior disturbances.

Chapter V discusses chemical sedation and stimulants. Any concern with the psychogenesis of variations in "courage, will-power, self-control" is dismissed

(p. 83 et seq.) as puritanical, in favor of an organic and physiological interpretation of these behavior deviations. Benzedrine "may cure" the "wickedness" of a child with behavior problems (p. 84); and dysrhythmias are claimed in a high proportion of all neurotics and psychopaths. In general one might say that the argument with respect to sedation is not too exceptionable; but that the overoptimism about such stimulants as thyroid and benzedrine is remarkable.

Chapter VI deals with continuous sleep. This is reported to be of value primarily in the neuroses, and not in agitated involuntal melancholias (for which convulsive treatment is advocated); nor in agitated depressions (for which insulin coma is urged); nor in depressions (for which they again advocate convulsive treatment); nor in manic or catatonic excitements (for which they advocate insulin); and not in anxiety hysteria with physical deterioration (for which they advocate modified insulin) (pp. 100-101).

According to the authors, continuous sleep is valuable in young manic-depressives, severe panics, for all patients who are too anxious for other forms of treatment, for patients with "stable personalities" who break under exceptional strains (especially in war), and as an emergency measure, combined with ventilation (p. 109). Here, again, there is a deviation from the basic premise when they state that "real treatment" starts after narcosis is over.

Chapter VII is devoted to special uses of the intravenous barbiturates. Narcoanalysis is described somewhat condescendingly on page 111, as useful primarily as a way of unmasking hidden symptoms, or as an index to the benefit to be derived from convulsive or other forms of treatment, and finally as a vehicle for "powerful suggestions." The authors ascribe some value to it in the acute neuroses of war and in acute hysterical conversion states.

This will suffice perhaps to summarize the general point of view and some of the specific conclusions reached in this book.

The final chapter (XI) contains a general discussion of the relation of psychology to somatic treatment. Here the authors take a consistent position. They seek the significant and effective variables entirely in the physiological field (p. 157). They state that "symptoms once thought to be psychogenic have now been found to rest on a deeper physical deviation" (p. 158); but both the symptoms and the deviations are left conveniently undefined. They argue that psychogenesis loses "importance but not validity" with the discovery of "organic etiology." Here one is perplexed again by semantic inconsistencies.

On page 169 it is argued that "methods of increasing hunger and sex will overcome many neurotic inhibitions" because "chronic neurotics lack general drive." This is indeed a curiously blind position to take, and indicates the failure of the authors to grasp the elementary fact that libidinal drives can themselves become a source and focus of anxiety, guilt and conflict. At the same time it is not without interest that, without

realizing it, they thus end by acknowledging the importance of instinctual drives in the genesis of mental illness.

LAWRENCE S. KUBIE

KARDINER, ABRAM, with the collaboration of LINTON, RALPH; DU BOIS, CORA; WEST, JAMES: *The Psychological Frontiers of Society*. New York, Columbia University Press, 475 pp. \$5.00.

If we are to have a scientific basis for attacking the problems of human society, there must be an integration of the knowledge of the personality which is available to dynamic psychology with the findings of anthropologists, economists, political scientists, and other students of social phenomena. How to proceed toward this goal is a puzzle. Tools of rigorous investigation in the common field remain to be forged; even mutually relevant concepts are lacking. It is difficult to state conclusions in a form capable of being tested by independent investigators using recognized scientific methods. The field is therefore occupied mainly by insights, guesses and philosophic systems rather than by demonstrable discoveries. Those who enter it are likely, after being baffled by its cloudy uncertainty, to retire to the customary techniques of their several disciplines. Statistical or institutional descriptions of group behavior accumulate apart from the growth of the knowledge of personalities, as if neither branch of learning could illuminate the other.

The principal virtue of this book is that it results from a serious and laborious effort at cooperative research in the interrelationship between personality and culture. Dr. Kardiner believes that he has discovered a technique capable of general application, and that use of this technique has established valid concepts. Whether he is correct no reviewer who has not tested his method is competent to decide, but the history of scientific advance has been marked by experiments of this kind, whether or not any particular finding is ultimately verified.

The main hypothesis which this project set out to examine is that there is such a thing as a basic personality structure associated with a given culture. The method is first, to describe the culture in terms familiar to anthropological observers; second, to infer, by employing psychoanalytic skill, what a typical personality in that cultural setting would be likely to be; and third, to test this inference by close study of a few individuals chosen as samples. In some cases psychoanalytic interpretation was supplemented in this testing by the Rorschach method. This procedure was applied to two widely different primitive cultures—the Comanche and the Alorese—and to a rural town in the American mid-west.

The conclusion is that each culture has its basic personality—with variations according to sex, function or status—and that this personality can be accounted for in dynamic terms related to the characteristics of the culture. Special attention is naturally devoted to

family mores and the early experience of children, though the whole culture is taken into account.

A method of this kind is, at least in its initial application, far from a precision instrument. Its conclusions must be stated in descriptive language, using a terminology which may be ambiguous or conceal intangible value judgments. Quantitative results are virtually out of reach. If it were possible for independent investigators of equal skill to repeat the experiment, their conclusions might differ. Nothing like a real psychoanalysis of the individuals studied was possible. There is little assurance that they constituted a representative sample. These defects might possibly have been minimized by a more selective and systematic procedure; the author evidently prefers a richer and more discursive type of report. It would be difficult for most readers to distinguish between his long-range inferences and his direct observations.

Nevertheless, this is a work which is likely to be consulted for long as one which breaks new ground. Dr. Kardiner's reflections, for instance, on what constitutes good adaptation in a society, why some cultures are stable and others unstable, and why the nurture typical of modern Western culture is in some respects ill-adapted to its institutions (or vice versa) are fertile. Like most explorers, he cannot see the whole new country and much of his work is necessarily crude, but his report cannot be ignored.

GEORGE SOULE

LEIGHTON, ALEXANDER, AND LEIGHTON, DOROTHEA: *The Navaho Door. An Introduction to Navaho Life*. Cambridge, Harvard University Press, 1944, 149 pp. \$4.00.

WEST, JAMES: *Plainville, U.S.A.* New York, Columbia University Press, 1945, 238 pp. \$2.75.

These two books dealing with anthropologic and psychosocial aspects of first, Navaho Indians and second, a "backward" rural American community, were written by two physicians (one a psychiatrist) and an anthropologist, respectively. They are similar in their approach, presenting historical sketches and descriptions of the land and its resources, then delineating typical life histories and the social structure.

The Leightons would have done better to include more systematic information on child-raising, as West does, because this crucial activity is so revealing of a culture's basic orientation. However, the Leightons provide more data on health and medicine than does West.

Both studies display their authors' respect and feeling for the peoples with whom they lived. In both instances observations, with a minimum of interpretation, are presented in fascinating detail, and in prose which is clear, tasteful and sensitive to the prevailing language.

The importance of these two books goes beyond Navahos and Plainvillers and consists in demonstrating that our international cooperation and understanding must begin with intranational understanding;

in a word, with an end to our intellectual (and other) internal imperialisms. The Leightons say: "We must utilize the experience we have with the minorities inside our boundaries and apply the general principles deduced therefrom across cultural lines outside the nation. Among the first of these is the requirement that we be reliable and willing to understand."

These books add to our understanding and are valuable contributions to a new science of man, genuinely, competently and straightforwardly concerned with the whole man; and hence narrowly useful for physicians aware of the complex relationship between culture and psychosomatic structure, but widely significant to physicians as citizens of "one world."

LOUIS PAUL

The Science of Man in the World Crisis. Edited by Ralph Linton, New York, Columbia University Press, 1945, 532 pp. \$4.00.

This collection of 21 authoritative articles, edited by Dr. Linton, Professor of Anthropology at Columbia, has a timely and continued pertinence in these days of chronic crisis. Departing from the customary review, I should like to set down a few remarks about a book I feel to be interesting and valuable.

1. Anthropology claimed to be a "science of man," yet dealt only with dead men and buried cultures. Anthropologists have at last emerged from museums to wrestle with live problems. For example, these are some chapter titles: "The Colonial Crisis and The Future"; "Nationalism, Internationalism and the War"; "Communications Research and International Cooperation"; "The Problem of Minority Groups."

2. *Merit*: Kardiner's fundamental article on basic personality structure, the keystone of the new border science of personality-culture interrelationships.

3. *Merit*: Dollard's chapter on acquisition of new social habits wherein he describes the psychotherapeutic situation in terms of *labeling* the unconscious or un verbalized elements in a patient's evaluational scheme (neurosis), thus giving these elements an "overtone of permissiveness." Dollard and George Peter Murdock both predict that modern learning theory will provide a fruitful amalgam with psychoanalysis. Dollard writes:

"Psychoanalysts have given but little and incidental attention in their theory to the importance of learning, and yet I believe that psychoanalytic theory is entirely congruent with learning theory . . . much of what learning theorists emphasize is hidden behind Freud's concept of "Durcharbeitung," or working through. . . . Learning theory has a rigor of concept and a connection with an experimental base which might aid in the development of psychoanalysis as a social psychology."

Murdock declares: "Reversing the usual scientific practice of making psychology an underlying discipline in relation to the social sciences, Freud founded his psychology on a cultural fact, though he used

the terminology of instinct. Whereas behaviorists look primarily to the inherited mechanism of learning for the interpretation of behavior, Freudians look to the conditions of learning, and in particular to the structure of family relationships under which the earliest human learning occurs in all societies. Both approaches are presumably sound, and the psychology of the future will doubtless result from their amalgamation."

4. *Demerit*: The interminable space accorded to "race." I hold with Ashley Montagu, and others, that the term should be discarded altogether, because, *inter alia*, it is a question-begging epithet, being operationally inadequate. (Some of the contributors fenced in *race* with quotation marks, which is a step toward discarding it.)

5. It is hoped that this book will become the basic text in college courses in anthropology, with the ordinary texts used as supplemental reading.

6. Linton has done an enterprising service for his specialty, giving us a highly useful presentation of modern problem-oriented anthropology. A new edition will be forthcoming, I hope, and may I suggest that it include a chapter on the contributions of general semantics, as these are an integral part of any science of man.

LOUIS PAUL

SOULE, GEORGE: *The Strength of Nations: A Study in Social Theory.* New York, Macmillan, 1942, 268 pp. \$2.50.

This book should be reviewed here—albeit somewhat belatedly—because it is concerned with the possible effects on social theory of a new "definition of man." Previously, man has been described as a parvenu ape, that is, an animal with a larger cortex, or a fallen angel. Man has been split into economic man, social man, man as consumer, man as the sum of his organs, etc. These partial, partitive, additive notions are inadequate, yet they continue to prevail in most social sciences.

Mr. Soule provides a modern, dynamic, psychosomatic description of man. Social scientists, he says, must learn to ask proper questions and must employ scientific method. Their results will then compare with those in medical and physical science.

By scientific method, he discusses the constant interaction of hypotheses and predictions (results) so fruitful, for instance, in the humanistic science of medicine, which is held up as an example to non-medical social sciences.

Mr. Soule succinctly reviews the basic ills of American society, proceeding to discuss what scientific method can promote for their removal. He analyzes past and prevailing economic theories for their implicit assumptions about "man."

What can sciences of human behavior contribute to this excursion in social theory? Mr. Soule goes on to summarize excellently the origin and development of Freudian theory, Pavlovian reflexology, psychosomatic medicine à la Dunbar, and experimental ani-

mal neuroses. These provide bases of a proposed general theory of man, which Mr. Soule then applies to a description of present economic behavior. Lastly, he discusses problems of values in science.

His remarks here would have been more in accordance with his own views on man, and also more scientifically adequate, had he explicitly realized that there is a uniquely characteristic human function called *time-binding*. That is, each generation begins where the preceding generation left off.

Mr. Soule, who is an economist, an editor of the *NEW REPUBLIC*, a member of the American Society for Research in Psychosomatic Problems Committee on Social and Cultural Problems, and Chairman of its Subcommittee on Psychosomatic Factors in Health Insurance, has written a book which should be read by all workers in social sciences; it may perhaps alter their basic assumptions about "man." Psychosomatically-minded physicians will be enlightened by seeing the far-reaching implications of a psychosomatic attitude and the strength of a scientific methodology.

LOUIS PAUL

LEIGHTON, ALEXANDER H.: *The Governing of Men*. Princeton, Princeton University Press, 1945, 404 pp. \$3.75.

Evacuation from the Pacific coast of 110,000 American citizens of Japanese descent, and their alien parents, against whom there were no charges of subversive activity, has been called our greatest wartime mistake. Commander Leighton, psychiatrist and anthropologist, was assigned to direct a research project at the Poston, Arizona, relocation center, and in this book he presents an extensive case history of the psychosocial, administrative aspects of our government's first large-scale experience with "displaced persons." The project advised administrative officers on prevailing situations at the center, and made observations and analyses bearing on the whole problem of the governing of men, especially in occupied areas.

The first part gives an overall picture of the social organization of Poston, its inhabitants and their frustrations, desires and motives, and tells what happened—to administrators and evacuees—when the social structure broke down in a short-lived strike.

Part Two deals with principles and recommendations concerning individuals, systems of belief and social organizations under stress. There is a valuable appendix describing the methods of the study and the relationships between researchers and administrators.

It is difficult to estimate what immense effects Leighton's principles and suggestions would have on world peace and cooperation if they were adopted by our military governments. "The great danger we face in occupation," Commander Leighton declares, "is that we shall come in believing in our power to make the people do anything we please and without taking into account their stresses, needs and beliefs—after stirring up more hatred because of this—retire shortly after the war is over without insisting on the few

constructive things that are in our power to insist upon and which the people would accept."

Because of its well-written combination of carefully studied examples with fact-oriented generalizations, this book is a major contribution to social science. It is of concrete interest to students of democratic methods and processes, and has utmost value for administrators, whether they work in medical schools, psychiatric hospitals, government agencies, military camps, or occupied islands.

LOUIS PAUL

WEST, RANYARD: *Conscience and Society: A Study of the Psychological Prerequisites of Law and Order*. New York, Emerson Books, 1945, 251 pp. \$3.00.

This book is devoted to the task of bridging the gap which separates the science of psychology from law and politics. It is a significant adventure since it is an application of the science of behavior to a specific—even though too all-inclusive—objective.

According to Dr. West, psychology points to a total society and a World Court: "People before states; Equality of race; Custodianship of backward peoples; All the aids to community that the economist, the politician and psychologist can suggest." In attaining this objective "no rival objects" are to interfere. It is to be a uniformity achieved by external force to the extent required. The world state is to be a supervening loyalty. Force is to be destroyed by force.

This strong reliance on externalization appears almost in the light of a modern version of repudiated natural law doctrines. For the argument is that most of the world's ills have been caused by the aggressive obsessional neurotic; that man cannot form "an objective and unbiased judgment of a situation in which he is emotionally involved"; and, therefore, the settlement of disputes must be by courts of justice administering through simple justice and equity. Stripped of the controversial matter involving the theories and personality of Dr. Freud, the author aims to attain a political science by minimizing bias and prejudice which arise from selective remembering and forgetting. In a sense, of course, this is the purpose of every kind of science which concerns itself with human relationships.

The author sustains this latter position in an interesting discussion of the political philosophies of Hobbes, Locke and Rousseau which, he asserts, were derived from their emotional life. But, strangely enough, the author by tacit omission takes it for granted that the transfer of judgment to others will eliminate the objectionable element. In a world of diverse races, languages, loyalties, and sovereignties it is expecting much of any external judge that he will easily forget and ignore his emotional ties. Indeed, the author has himself recalled that at the time of the French Revolution equity was administered "alas by the hands of partisan judges." While external judging is often more objective than the judgment of the parties, the whole history of the experience of mankind negates any right

to feel too secure about the elimination of emotional bias without a complete change in the common concept of the judicial function.

This has been a matter of considerable concern amongst the students of jurisprudence, and a growing literature attests an interest in improving judicial competency. It is a matter of common knowledge that even the most worthy tribunals are not free from that affective bias which characterizes all political action, whether by law or otherwise. Hence, from the psychological point of view, Dr. West has advanced little in the specific remedy he proposes. It is rather traditional power politics supported by the additional insight the author has achieved.

The practical problems presented by books of this type are serious. The lawyer or judge is not able to follow the findings and thinking except in broadest outlines and these may, therefore, be too easily taken for granted. This holds true as well for the reading of scientific journals which are, by reason of inevitable specialization, written in a technical language and style which are not understandable by the largest portion of the medical profession—let alone the legal profession. Yet, there can be no case history in which law and legal relationships and institutions do not play a most important part. Nevertheless, the psychological sciences and social sciences for the most part move in their own orbits—and some sincerely believe this is as it should be. But it must be a prime desire of any worker in these various sciences that their work is to the end that it be assimilated by those who make, interpret and enforce the laws.

We are not in agreement with Dr. West in a number of his conclusions and in his use of some of the materials of jurisprudence. A detailed treatment of these matters is not attempted here. The fact that his work was recently favorably reviewed at some length in the *Journal of the American Bar Association* by a former President of the Association indicates that the bar is interested in this type of book. This is of itself important.

A. J. LEVIN

GRINKER, ROY R., AND SPIEGEL, JOHN: *War Neuroses*. Philadelphia, The Blakiston Co., 1945, 141 pp. \$2.75.

This book was reviewed in the January, 1946, issue under the title of *War Neuroses in North Africa, The Tunisian Campaign (January-May, 1943)*, prepared and distributed for the Air Surgeon by the Josiah Macy, Jr., Foundation, September, 1943. The Blakiston edition has now made the book available to the public.

BOOK NOTES

ZENO, LELIO, AND PIZARRO CRESPO, EMILIO: *Clinica Psicomatica*. Buenos Aires, El Ateneo, 1945, 361 pp. 18 pesos Argentine.

This book represents the collaboration of a surgeon, Dr. Zeno, and a psychiatrist, Dr. Pizarro Crespo (now

deceased), over many years. The first part consists of a rather heterogeneously eclectic exposition of some newer ideas in medical psychology, which gets rather lost in the multitudinous terminologies of Adler, Freud, Jung, Kretschmer, Kunkel, Stekel, Schilder, and Mira, among others, and which leans heavily on the reports of military psychiatrists of this war. The second part discusses goiters, gastroduodenal ulcers, chronic appendicitis, accidents, deformities, "hyperemotivity," and plastic surgery. Goiters are interpreted (in part) as due to anxiety states. The appendicitis cases reported seem all to be hysteria. The ulcers are not considered in the light of the Chicago school's work, nor are the reports very illuminating. Stragely, Jung and Stekel are given credit for discovering that accidents may be due to self-punishing intentions. (No reference given.) The authors have an impression that the American Society for Research in Psychosomatic Problems centers about a nucleus of emigrated European psychoanalysts. In general, the psychiatric findings do not convincingly enter into a causal nexus with the somatic findings and leave all the central problems untouched. Perhaps this is a limitation of such eclectic methods.

BERTRAM D. LEWIN

Manual for the Study of Food Habits: Report of the Committee on Food Habits. Carl Guthe, Chairman; Margaret Mead, Executive Secretary. Bulletin of the National Research Council, No. III, January 1945.

One of the important contributions of this study lay in pointing out that research in food habits was in a blind alley so long as it asked the customary but static question, "How can we change food habits?" Instead, it is necessary first, to discover the nature of nutritional behavior, and then proceed to the practical and more dynamic question, "How can we develop food habits which have the requisite stability and flexibility appropriate for given individuals in a given society at a given time?"

This manual attempts "to set up preliminary standards for the collection of basic data on food habits which any study, whether pursued from the standpoint of psychology, psychiatry, sociology, anthropology, or home economics, should be responsible for recording or systematically taking into account." Contents include descriptions of a large number of studies of food habits and a well-indexed bibliography of nearly 700 titles.

Future researchers will be grateful to these investigators for their conscientiousness in recording their techniques and formulations. One wishes that their experience could be applied to other public health problems.

NINA RIDENOUR

GUMPERT, MARTIN: *Hahnemann: The Adventurous Career of a Medical Rebel*. New York, L. B. Fischer, 1945, 251 pp. \$3.00.

Hahnemann, the founder of homeopathy, does not come to life in this book. The reader is left suspended

between two opinions. Either the hero was an uncompromising champion of the right, malignly persecuted by the authorities and the medical faculties; or this was his private opinion of himself, and his contrariness and stubbornness caused his difficulties. The long polemics of Hahnemann with his opponents leave one mystified by the confused issues and the general ignorance of both parties. This reviewer's interest in the book was dulled by the effort to romanticize Hahnemann into a kind of Wilhelm Meister, his first wife into a kind of Dorothea, and his second wife into a kind of Mlle. de Maupin. The following passage gives the spirit of much of the fine writing:

"Spring came to the young Hahnemann couple: crocuses pushed their way through the black soil of their garden; life returned to the dead bushes; the gentle sunshine of the lengthening days made the world suddenly brighter and gayer. One afternoon . . . Henriette visited the aged midwife of Gommern . . . ; when she returned, she had the luminous and exalted look of a youthful saint." Etc., etc. That is, Mrs. Hahnemann was pregnant.

BERTRAM D. LEWIN

SEARS, ROBERT R.: *Survey of Objective Studies of Psychoanalytic Concepts*. New York, Social Science Research Council, 1943, Bulletin 51, 170 pp. \$1.25.

This report, by the professor of child psychology at Iowa, summarizes and evaluates experimental and observational studies which pertain to Freud's basic formulations concerning personality, namely: erotogenesis, childhood sexuality, object choice, sexual distortions, fixation and regression, repression, projection, and dreams. Technics are not covered. Suggestions are made for further testing of analytic principles, about which Professor Sears has several critical things to say. For instance, he calls the Oedipus relationship "a lesson in cultural relativity," and finds "no indication of a universal cross-sex parental preference" among child or adults.

LOUIS PAUL

LOWY, SAMUEL: *New Directions in Psychology: Toward Individual Happiness and Social Progress*. New York, Emerson Books, Inc., 1945, 208 pp. \$3.00.

By "new directions" is meant the application of psychoanalytic principles to social problems. The author, a Slovakian analyst for fifteen years and a pupil of Stekel, here retails his analytic comments on the socio-political-economic scene, endeavoring to acquaint lay people with the ubiquitousness of aggression, and the necessity for the state-apparatus to combat it actively with education, propaganda, increased security, and more favorable socio-economic conditions.

His main idea is: "Do not let us rely, in the great cause of human happiness, on the voluntary fairness of people alone, if there be a way of intensifying, through a better-planned social process, this fairness of spirit in all inter-human relations."

The aim is worthwhile. Unfortunately his style is

preachy and pedestrian, and somehow or other his observations seem commonplace after Alexander's *This Age of Unreason* and Menninger's *Love against Hate*.

LOUIS PAUL

Primary Behavior Disorder in Children—Two Case Studies, by Staff Members of the Jewish Board of Guardians. New York City, Family Welfare Association of America, 1945, 59 pp. \$.60.

Psychiatric social work treatment of two hostile, destructive, "acting out," and neurotic girls (one aged 8 and the other 5), is presented. The mother of the second child was also treated, at the same time, by a psychiatric social worker. The changes in the child, parents and situation, as well as the attitudes of the therapists during the treatment, are set forth. The emphasis in the book is on: taking responsibility for giving help (with the advice of psychiatrists, when needed); making careful diagnoses as one proceeds; treating the parent or parents as well as the child; and relating the disorders of the family to those of the child. The guiding principle of the therapy would appear to be: giving basic acceptance to the child as a method of winning him or her to new ways. The thinking in the book is much influenced by psychoanalytic theories. The psychiatric comments are by Dr. J. H. W. van Ophuijsen. Both cases are presented by the worker, Yonata Feldman. One would like to hear more of the consultations between the therapist of the parent and that of the child, as the therapy proceeded. One would also like to learn more fully the details as well as the guiding principles of this agency's methods in the handling and treatment of these and other types of cases.

GEORGE L. PERKINS

Alcohol, Science and Society. Twenty-Nine lectures at Yale Summer School of Alcohol Studies. New Haven, Quarterly Journal of Studies on Alcohol, 1945, 473 pp.

A problem as complex and as grave as alcoholism requires the study of a variety of specialists. The educator, the minister, the psychiatrist, the sociologist—each of these and many others has his particular contribution to make. This does not preclude determining where the preponderance of help should be sought. One may well question whether a proper weighting has been assigned to the several sources of help when, of twenty-four contributors to this volume, three discuss the legal implications; five (possibly six) are physiologically oriented; at least three write from the point of view of the religious leader; and only two are psychiatrists. This type of book suffers weaknesses inherent in most volumes written by a series of contributors; spotty in quality, uneven in value to the eclectic student. The data on physiology seem sound; the sociological and anthropological articles are informative, and the chapter "Pastoral Counseling of Inebriates" by Rev. O. R. Rice is excellent.

J. LANDER

PUTNAM, TRACY J.: *Convulsive Seizures: How to Deal with Them*. Second edition. New York, Lippincott, 1945, 178 pp. \$2.00.

This is the second edition of an authoritative, wise, well-written, small "manual for patients, their families, and friends," the first edition of which was favorably reviewed in this journal two years ago (6:186, 1944). Added material includes data on new drugs and insurance, and consideration of some legal problems and of the difficulties of employment. As Dr. Putnam says, "The news is practically all good" for seizure sufferers.

LOUIS PAUL

GREISHEIMER, ESTHER M.: *Physiology and Anatomy*. Fifth Edition. Philadelphia, J. B. Lippincott Co., 1945, 841 pp. \$3.50.

The author has revised this text a fifth time in order to bring the book more up to date, and to make it more useful still for students. A chapter on the physiology of aviation has been added for the particular use of future flight nurses. The principal revisions which have been made are in the chapters on the anatomy and physiology of the nervous system, body temperature regulating mechanisms, glands of internal secretion, and digestion (as it pertains to vitamins). The principle of discussing first the anatomy and then the physiology of the various systems, which was previously found so useful, has been maintained. Not only the anatomy and physiology but also the chief diseases of each of the systems (with some of the laboratory methods of their study) are briefly presented. Such physiology of disease as is useful to a nurse is outlined. One wishes that the author had devoted more discussion to mental hygiene and personal adjustment, since this is so eminently a nurse's book. Neurotic adjustment is correlated with a subcortical level of response and it is almost implied that the individual can consciously and deliberately choose between these ways without help. One would like to see some mention of psychosomatic problems in the discussion of the physiology of the nervous system.

GEORGE L. PERKINS

HAMBLÉN, E. C.: *Facts for Childless Couples*. Springfield, C. C. Thomas, Inc., 1944, 103 pp.

This little volume which can be easily read, and as easily understood, in an evening is concerned with presenting the facts about the problems of infertility to our patients. It is meant primarily for the patient, but it is just as valuable for the medical student and perforce for the practitioner of medicine who wishes to review the overall picture of sterility investigation without becoming entangled in some of the more encyclopedic textbooks on infertility.

Dr. Hamblén knows his subject thoroughly and his choice of minimizing the hope of help from some of the highly advertised endocrinological products is a particularly happy one. The last chapter on "Some Popular Misconceptions" clears up some of the fallacies extant among patients and practitioners alike.

Because of the factual content and straightforward presentation with sympathetic understanding while avoiding sentimentality, I feel that this book can be recommended especially to our patients whose infertility has pushed them into an emotional crisis.

HOWARD WALSER

CORNER, GEORGE W.: *Ourselves Unborn*. New Haven, Yale University Press, 1944, 188 pp.

This volume is the story of the development of the human embryo, approached not only from the standpoint of the microscopic anatomist but also of the philosopher and mystic. The factual story of the development of the embryo is presented simply so that most of the story, as Dr. Corner presents it, could be used by the medical student in preference to many of the more well-known textbooks on embryology. Dr. Corner's philosophical approach to the development of the soul as differentiated from the germ plasm is scholarly, forceful and interesting. The historical and literary quotations and excerpts tend to make the volume as idealogical as it is factual.

HOWARD WALSER

DAVIS, MAXINE: *Woman's Medical Problems*. New York, McGraw-Hill Publishing Co., 1945, 220 pp.

The first edition of the book is largely a reprint of Miss Davis's articles previously published in "Good Housekeeping" magazine. She has done a better than average job of medical reporting, and for women who are curious about their physiology and commoner complaints the book should fulfill a definite need.

HOWARD WALSER

MORENO, J. L., AND JENNINGS, HELEN H.: *Sociometric Measurement of Social Configurations Based on Deviation from Chance*. Sociometry Monograph No. 3. New York, Beacon House, 1945, 35 pp. \$1.50.

BRONFENBRENNER, URIE: *The Measurement of Sociometric Status, Structure and Development*. Sociometry Monograph No. 6. New York, Beacon House, 1945, 80 pp. \$2.25.

"The sociometric test consists of an individual choosing his associates for any group of which he is or might become a member." By its use "the frequency, strength, pattern, and basis of the interrelationships which bind the group together and give it distinctive character" can be diagrammed and statistically examined. The first monograph is a basic work in its field and was originally issued in 1938. The second is an extension and refinement of the first.

LOUIS PAUL

HARRINGTON, MILTON: *The Management of the Mind*. New York, Philosophical Library, 1945, 210 pp. \$3.00.

MATHEWS, ARTHUR GUY: *Take It Easy: The Art of Conquering Your Nerves*. New York, Sheridan House, 1945, 239 pp. \$2.98.

Happily thin, these volumes swell the interminable stream of recipe books for mental health, often implanting *active* false knowledge in a defenseless public. The first is written by a psychiatrist alleging tension as the basis of nervous ills and denying a role to unconscious factors. The other, an egregious production, ungrammatically sets forth a hodge-podge of clichés and medical misinformation.

LOUIS PAUL

BOOKS RECEIVED

CURRAN, CHARLES A.: *Personality Factors in Counseling*. New York, Grune and Stratton, 1945, 310 pp. \$4.00.

ENGLISH, O. S., AND PEARSON, G. J.: *Emotional Problems of Living*. New York, W. W. Norton and Co., 1945.

HERZBERG, ALEXANDER: *Active Psychotherapy*. New York, Grune and Stratton, 1945, 152 pp.

KUPPER, HERBERT I.: *Back to Life*. New York, L. B. Fischer, 1945, 220 pp. \$2.50.

LYON, E. G.; JAMBOR, H. M.; CORRIGAN, H. G.; AND BRADWAY, K. P.: *An Experiment in the Psychiatric Treatment of Promiscuous Girls*. San Francisco, Psychiatric Service, City Clinic, 1945.

MUNROE, RUTH LEONARD: *Prediction of the Adjustment and Academic Performance of College Students by a Modification of the Rorschach Method*. Stanford University, Stanford University Press, Applied Psychology Monographs No. 7, 1945, 78 pp. \$2.00.

Psychoanalytic Study of the Child. Edited by Otto Fenichel and others. New York, International Universities Press, 1945, 423 pp. \$6.00.

RIBBLE, MARGARET A.: *The Rights of Infants: Early Psychological Needs and Their Satisfaction*. New York, Columbia University Press, 1943, 130 pp. \$1.75.

ROHEIM, GEZA: *The Eternal Ones of the Dream*. New York, International Universities Press, 1945, 332 pp. \$4.50.

STEINER, LEE R.: *Where Do People Take Their Troubles?* Boston, Houghton Mifflin Co., 1945. \$3.00.

TEMKIN, OWSEI: *The Falling Sickness*. Baltimore, Johns Hopkins Press, 1945, 395 pp. \$4.00.

TREDGOLD, A. F.: *Psychological Medicine*. Baltimore, Williams and Wilkins, 1945, 508 pp. \$5.00.

Trends of Mental Disease. Edited by American Psychopathological Association, New York, King's Crown Press, 1945, 114 pp. \$2.00.

WOLBERG, LEWIS R.: *Hypno-Analysis*. New York, Grune and Stratton, 1945, 342 pp. \$4.00.

BACK IN PRINT

MUCOUS COLITIS

A PSYCHOLOGICAL AND MEDICAL
STUDY OF SIXTY CASES

*By Benjamin V. White, M.D.,
Stanley Cobb, M.D., and
Chester M. Jones, M.D.*

The thesis is presented that "... mucous colitis is a physiological disorder of the colon brought about through the action of the parasympathetic nervous system . . . the commonest source of parasympathetic overstimulation in patients with mucous colitis is emotional tension." This tension is most commonly produced by anxiety, guilt and resentment and was present in 92 per cent of the cases studied. Common personality traits were "over-conscientiousness, dependence on the opinions of others and sensitivity." The clinical, experimental, psychiatric and therapeutic aspects of mucous colitis are fully discussed.

CONTENTS

- Foreword
- I. Historical Review
- II. Clinical Syndrome
- III. Experimental Production of Lesions
- IV. Psychological Considerations
- V. Role of the Autonomic Nervous System
- VI. Therapy
- VII. Summary

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EMOTIONAL FACTORS IN THE COURSE OF PREGNANCY †

RAYMOND SQUIER, M.D.,* AND FLANDERS DUNBAR, M.D.**

INTRODUCTION

Psychosomatic problems in gynecology and obstetrics include dysmenorrhea, dyspareunia, frigidity, some varieties of colporrhea, certain aspects of the toxemias of pregnancy, lactation, the correlation of personality types with the pattern and efficiency of labor, physical and emotional adjustments in the puerperium, and probably some determinants of fertility with regard to conception, as well as to the maintenance of pregnancy. Almost every practicing gynecologist and obstetrician would agree with this statement but too little supportive case material has been analyzed and presented.

Preliminary investigation suggests that the most promising technique of psychosomatic research in gynecology and obstetrics is with individuals or with very small groups in private practice, rather than with larger numbers in hospital populations, whether in-patients or out-patients—at least in the present state of development of hospital clinics. Women studied in private practice are superior for psychosomatic research because they can be seen as often and as extensively as the physician wishes, the rapport between patient and physician, and hence the availability of confidential material is greater, and the physician comes to have a fuller, longer and more detailed perspective of the patient. It is to be understood, of course, that the patient is willing to make herself available for research and that her personal identity is kept concealed in any and all reports of the material.

This presentation consists of material by both authors and deals with spontaneous abortion, premature delivery, stillbirth, and successful full-term delivery. The objective is ~~not to prove anything~~. Instead, it is to present some facts which, if carefully studied, may provide clues to the solution of problems in this field which have been generally neglected, either because they were baffling or because they were overlooked.

† Paper read in part at the Conference of the Committee on Infancy and Early Childhood of the American Society for Research in Psychosomatic Problems, and the Cornelia Corner, held in Detroit, Michigan, October 25, 1944.

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There is reason to suspect that the vacation of an obstetrician may be a valid topic for investigation,—not wholly humorous, either. Some obstetricians take vacations of approximately one month each year. One such obstetrician selected the vacation month according to the least number of patients booked for delivery, but every year the caprice and perverseness of the stork hounded and haunted him *in absentia*. The importance of this problem will be illustrated later in concrete case material.

One year recently this obstetrician decided to be definitely predictable, in contrast to his patron bird, and to accept no patients whose expected dates of delivery would fall within the selected vacation period. Five such patients came in within the next ten days. To each the vacation plan and schedule were carefully and frankly explained. Four of these patients persuaded the obstetrician to accept them, either on the chance that they would deliver sufficiently early or late for him to attend them, or that they would have prenatal care by him but delivery by a colleague during his absence. All of these 4 patients spontaneously aborted within the next two weeks, despite the fact that their regimen of living appeared not to have changed.¹ One of the women who aborted, as known because she was attended in her home at the time, promptly recovered from the experience and went along in excellent health for two months. Then she came back for consultation because she had not resumed menstruation. To the amazement of the obstetrician and to the consternation of the patient, it was found that she still was undoubtedly, and apparently normally, pregnant, gestation having the stage of development dating from the same conception that had preceded the abortion two months previously. Obviously this patient (whose pregnancy was incidental, unplanned and quite unwelcome) had had a twint pregnancy, had aborted one embryo but was proceeding normally in the development of the other. The situation was so explained to her. She left the office somewhat bewildered at about 3 p. m. At 11 p. m. that same evening her husband called the obstetrician and said that his wife was having pelvic cramps, she felt miserable (as did he also), and they both thought that she was having another miscarriage. It was carefully explained by telephone

¹ The fifth patient who had wished to be accepted and finally decided in favor of another obstetrician aborted also.

that such a mishap was extremely unlikely in so far advanced a pregnancy, and they were reassured as far as possible. By the next morning this patient had lost all symptoms and fear (or hope?) of miscarriage and thereafter she continued in a normal course of pregnancy. She began labor and was delivered before the obstetrician went away.

Such were the experiences of these 4 patients. Who can be sure that their spontaneous abortions had nothing to do with the prospect of the departure and unavailability of their obstetrician?

DESCRIPTION OF CASE MATERIAL

Mrs. Y was referred by the obstetrician to the consultant for psychosomatic evaluation; Mrs. Z was referred by the consultant to the obstetrician for the care of a pregnancy which appeared to have important psychosomatic complications. It is to be regretted that as yet there is no adequate term, analogous to obstetrician, to designate the specialist in psychosomatic diagnosis and treatment.²

Mrs. Y

CLINICAL REPORT

In 1933 in New York another physician had removed Mrs. Y's appendix and partially resected her right ovary because of what was described as a small ovarian cyst. Despite adequate exposure to conception, and no contraception, the patient failed to conceive during the next few years, during which time several semen analyses of the husband yielded normal findings and tubal insufflations of the patient showed apparently normal patency.

In 1940 she did become pregnant (the second time) and placed herself under the care of an obstetrician. On approximately the thirty-first day after the last menstruation, or five days after the first missed period, she began to have a little vaginal bleeding that continued for ten days and then ceased. For this she was given a considerable but

unknown amount of progesterone. The patient continued in pregnancy without complication until the middle of the fifth month when she began again to bleed a little. She says that she informed her obstetrician but he did not see her until some two and one-half days later, when she lost that pregnancy. The fetus was a male which was said to be macerated and was approximately 9 inches long. The Wassermann reaction of the patient was then, and whenever tested, negative.

A third conception started in 1941. The last preceding menstruation began July 13th. Thirty-one days later, or six days after the first missed period, she made her first visit to her present obstetrician, as recommended by a friend who was an obstetrician in another city. Her general and pelvic physical status were normal for early pregnancy, and she was so informed. Three days later, on August 16th, she had slight vaginal bleeding twice, but she did not telephone her obstetrician until the next day, whereupon rest in bed was prescribed, also thyroid, one grain daily, because the basal metabolic rate on the preceding day had been found to be -10. The threat of abortion ceased and the pregnancy developed through nine visits to the obstetrician, into the middle of the sixth month. However, in mid-November, when the patient was four months pregnant, she became worried lest she repeat the loss that she had experienced in her second pregnancy at a corresponding stage. She was given vitamin K to shorten her blood-clotting time, and the pregnancy continued in apparently good condition. In early December, the fifth month, the patient had a recurrence of a condition which is significant in her history; namely, colitis and diarrhoea, such as she had had at one time or another during several years. Paregoric was prescribed, without much success. Later in the same month she received calcium. The next month, because of nervousness, barbiturates were given. Also, for several weeks the patient was allowed to eat practically nothing but oatmeal which she had found from experience alleviated the colitis and diarrhoea. She was seen by the obstetrician on January 7th and four days later he left for his vacation without telling her, inasmuch as her baby was not due until April. By regular appointment she returned to the office on January 25th to be checked by the experienced obstetric nurse, from whom she learned that the obstetrician was away and that his calls were being taken by a competent colleague.

Five days later, two days before her obstetrician's return from vacation, the patient developed uterine contractions. They persisted despite the fact that

² While writing this paper the authors have been impressed again with the clumsiness of conventional designations of the specialist in psychosomatic medicine. There is need for a term such as the designation "obstetrician," "pediatrician," "internist," "psychiatrist," "psychoanalyst," and "gynecologist." "Psychosomatist" is analogous, but unfamiliar. In recognition of this need and as a suggestion to others who find the same difficulty, and who protest against the "cumbersomeness" of such expressions as "specialist (or expert) in psychosomatic medicine," "psychiatrist (or psychoanalyst) with special interest in psychosomatic medicine," or the inherently dichotomous term "psychosomatist," Dr. Squier has discussed the use of the term "integralist" in his paper "Integral Medicine: A New Term," which appeared in *Psychosomatic Medicine*, July 1945.

she went to bed and took codeine as prescribed by the confrère to whom she telephoned. Additional sedation by codeine and a barbiturate failed to stop the contractions, whereupon she was admitted to the hospital. On admission the patient was having contractions every 3-4 minutes and a slight blood-tinged discharge from the vagina. Fetal movements were palpable. Because of the threatened premature labor she was given morphine, progesterone and vitamin E. Nevertheless, that night at 1 a. m., she delivered a premature *female* stillborn fetus.

There appeared to be evidence in the placenta of partial premature separation, a finding of dubious relation to the slight vaginal bleeding which the patient had had in the first month of pregnancy, yet a finding of interest and perhaps significant relation to the circumstances of the premature stillbirth.

When the obstetrician returned he was informed by his colleague who had attended the patient, and by the nurses, that she had been very much depressed, tearful and "shut-in." During the next week or so she improved a good deal. She discussed freely and rather eagerly the undertaking of another pregnancy. It was agreed then that she should have therapy against anemia and bleeding. Also, it was explained to her that the premature termination of the pregnancy just experienced was quite different from her previous experience wherein the fetus had been born macerated and had given evidence of intrauterine death at an indeterminate time before delivery.

At postpartum review five weeks after the miscarriage all findings were normal.

Several conferences with the patient and her husband disclosed serious emotional factors, now made evident for the first time. It was agreed that she would be interviewed by the consultant for a psychosomatic survey.

A fourth conception occurred several months later. The patient's last menstruation was June 29, 1942. It was agreed that she need not see her obstetrician during the first two or three months, provided she appeared to be doing well. Her first and only office visit to him during that pregnancy was on September 28th. All findings were normal for a pregnancy nearing the end of the third month.

Twelve days later the patient developed slight uterine contractions and observed a few spots of pinkish discharge from the vagina. She was much disturbed at this time. A conservative regimen of rest and sedation was prescribed and she was moved into the hospital. The contractions diminished, the staining ceased, and at 7 p. m. the patient was

resting comfortably and seemed to be improved. The obstetrician and his consultant in the psychosomatic aspects of her problem arrived at the hospital at 5:15 a. m. The patient was fairly comfortable. She was not bleeding but the fetal head protruded through the cervix into the vagina. Thereupon the fetus was easily expressed from the vagina by quite moderate pressure on the fundus of the uterus. After the patient received 1 c. c. of ergotrate intravenously the placenta was expressed easily and intact. There was practically no blood loss. The further course of this patient was quite uncomplicated insofar as her obstetric status was concerned.

The fetus was a stillborn *male* weighing 310 gms., or 11 oz. Postmortem examination disclosed no evidence of congenital malformation or of trauma.

Approximately two months later the patient was seen in postpartum review by the obstetrician. She had menstruated three times normally, at intervals of 25-26 days. On physical examination there was no demonstrable damage or dysfunction. At her request she was given a prescription and instruction for contraception. Blood tests of the patient and her husband revealed that both were of the same blood group "O," and both were Rh positive.

This is the conventional account of this patient's obstetric experience. There follows a discussion emphasizing her psychosomatic status.

PSYCHOSOMATIC SURVEY

Mrs. Y, aged 35, was referred in the spring of 1942, three weeks after the third unsuccessful termination of pregnancy. The following facts are basic for an understanding of these pregnancies:

1. Two months prior to their marriage the patient and her husband-to-be decided on an induced abortion. This was fairly adequately performed. The reasons given were:

- a. The financial situation would make it difficult to care for a child at this time.
- b. Both were professional people under the necessity of traveling, and for a year or two it looked as though it would be impossible to provide a home for a baby.
- c. The patient was afraid that the process of becoming a mother might deprive her of her fiancé's affection.

It is interesting that the patient's father visited her when she was in the hospital at this time and he told her that she had done a terrible thing, and that as a result she probably never would be able to have a baby.

2. When the patient returned to her home two years later she determined to become pregnant and it was at that time that she suffered her first attack

of colitis. This incapacitated her so that it was necessary for her to give up her job. She then had an appendectomy (the appendix was normal), plus a resection of a small right ovarian cyst with conservation of the remainder of the ovary.

For eight years the patient continued in her endeavor to become pregnant. She consulted many physicians, had several tubal insufflations, was told that there was nothing wrong with her or her husband, and reached the conclusion that she was sterile.

Then, in 1941, her father died of diabetes and hypertensive cardiovascular disease. Immediately after his death she became pregnant unexpectedly. This pregnancy terminated in a spontaneous abortion at 4-5 months, "macerated stillbirth, 9 inches long." During this pregnancy she had thought of her child as a re-creation of her father, carrying on her father's life—actually her father's child. Both she and her husband had had misgivings about the child because for the first time, as a result of her father's death, they "really belonged to each other." That is, they had lived with the patient's father in a triangle situation and now they were about to create another "triangle situation" in having a child. They both hoped that the child would be a girl because a girl would make the new triangle easier to bear and less paternally dominated. They were told that the lost child was a boy. The husband, having competed with his father-in-law for his wife's affection over a number of years, felt that if now another individual were to compete for her affection it would be easier for him if it were a girl than if it were a male like himself and his father-in-law.

3. About six weeks thereafter the patient became pregnant for a third time and consulted her obstetrician on August 13, 1941, reporting LMP July 13th. She was referred to him by a physician who was a friend of the family because she had not liked or trusted her former obstetrician. Her dislike of that obstetrician was not based solely on the unfortunate outcome of the pregnancy; there was considerable evidence that he had handled the patient, including her anxiety, nausea and colitis, rather unskillfully.

4. The third pregnancy was complicated by extremely severe colitis, as well as by nausea and vomiting—all uncontrolled by thyroid, proloid thyroid, luminal, seconal, and paregoric. In spite of these complications pregnancy continued normally for nearly seven months, except for "spotting" reported on August 16th. At the end of the sixth month the obstetrician went on a vacation. When,

a week or so later, she learned of this through the office nurse, the patient said that it was all right since he would be back in time to deliver her baby. But she was very much disturbed by his absence, experienced a severe exacerbation of colitis, and after a week of attempting to adjust to it, with the aid of sedatives, she had, as previously related, a spontaneous premature delivery two days before the return of her obstetrician. She was cared for by one of his colleagues in whom, in spite of his gentleness and competence, she lacked confidence.

5. The consultant in psychosomatic medicine first interviewed the patient three weeks after this miscarriage. The patient said that she was more disturbed about losing this baby than she had been about the two previous ones because this one had been a girl, which was what she wanted. She said that one reason that she was crying was that the best obstetrician she had ever known, on her follow-up visit two or three days before, had greeted her by inquiring: "Well, how's the baby?", which to her meant that he was interested in her only mechanically and that he was not interested in her as a person. Too many obstetricians, because of time pressure, make such slips and too many of them are unaware of the psychosomatic importance of such slips. For example, this patient had a severe recurrence of colitis following this experience with the obstetrician in postpartum follow-up interview.

6. After six visits for psychosomatic treatment within two weeks this patient recovered from her colitis. An important factor was discovered to be an infantile fixation about anal pregnancy. She then developed an accident habit. She was constantly slipping, falling, injuring her knee, and she barely missed being run over. She continued psychosomatic treatment for three months and then asked if she were not well enough to try another pregnancy. She was advised against it, but nevertheless she became pregnant "by accident" in 1942. She was upset by this unplanned fourth pregnancy, discussed the possibility of having another induced abortion, and then decided to continue the pregnancy.

The course of this fourth pregnancy was relatively uneventful and the patient, because of work pressure, took a two months' vacation from her doctors. There was practically no nausea and no colitis, but one weekend when she knew that both of her doctors were out of town, although only a short distance away, she developed "cramps and bleeding."

On Sunday, October 10th, the consultant had five long distance telephone calls with this patient. The first three related to symptoms for which

secondal, vitamin K and rest in bed were recommended, and there was the question also: "Should she get in touch with her own obstetrician by long distance telephone or would his colleague who had taken care of her during his previous absence be preferable?" She decided to call her own obstetrician. Her symptoms continued despite therapy and she was admitted to the hospital at noon that day. The following is an excerpt from her first telephone conversation from the hospital:

Pt. I'm through. I'm in the hospital. The contractions have stopped. I can't figure it out. I felt fine until the middle of the night.

Dr. What did you do last night?

Pt. We went to a cafeteria for dinner, then to a play which was very poor, and when we got home I had a cup of tea. In the middle of the night I woke up from a dream and all that came out of it was the word "father." I had been reading *Equinox* before going to sleep; it was a terrible book. The plot is: a pseudo-analyst who uses analytic technique as a sadistic instrument and who has overintellectualized his emotional life is called in by the father of a young girl. The analyst had previously maneuvered the father into doing this. The girl is in love with her father and her father with her, although they both try to conceal it from each other. The analyst, by facing the girl with her feeling about her father, drives her to commit suicide by hanging. I had a strange feeling when I woke up, as if I were trying to force something back. When I went into the bathroom in the morning I discovered that I was bleeding.

A half hour after this conversation with the consultant the patient said: "I feel quiet now; if I could just keep on feeling quiet it would not be necessary for you to come; I could see you on Monday when you come into town." Then she added significantly: "I have not made up my mind to anything."

The obstetrician and the consultant arrived at the hospital about 6:30 that evening, saw the patient and discussed relaxation, her dreams and her father. Her letters, written two months previously, while she was in the country and not under treatment, were reviewed, together with her last letters written prior to her return to New York. Excerpts from these communications follow:

August 15, 1942.

(The night before the slight vaginal bleeding in the first month of this fourth pregnancy.)

I feel so wonderfully well that I am tempted to call you and tell you so. I slept beautifully and this morning I was as normal in functioning as it is possible to be. I feel great; I feel reposeful. I was so at ease during that unspeakable trip that I had no trace of the feverish impatience that I usually have on trains. I caught myself smiling to myself a number of times. As I got to New York I had a very happy feeling—a very assured feeling. It suffused me. It was saying to me: "This baby is going to be a cinch. You'll have it; the first ten months it will be a little vegetable and

you'll go along working beside it, and by the time it starts to need doing and watching, your husband and you will have found a lot of solutions. You're both going to find them and the baby will be a *side pleasure* while the solutions are happening."

September 23, 1942.

After I set down yesterday's note to you I tried to work, but it was impossible. I was really paralyzed. I looked at the typewriter for an hour or so, kept jumping up and going to the bath to see if I was leaking, and biting my nails. My brain was on that old merry-go-round: "bleeding, then the pains, and then the loss. . . ." I kept thinking about how long I would go this time—four months, or six, or seven, or when it would happen to me. We went out for lunch and I walked very carefully. I had a very worried vertical line between my eyebrows and I looked like hell. At lunch a friend came into the restaurant and we exchanged those hearty meaningless greetings that are so current. We went back to the apartment, but I couldn't do anything—sew, work, read, or even sit. Strangely, my rectum was fine—no spasm, no tightness, but there was a lot of gas in the intestines. Around three my husband said: "Let's walk in the park," and I said "Yes," but I was in an agony of doubt. "Is it wrong; is it too strenuous; am I doing it because it is bad for me, or good for me? How will I feel if it makes me bleed more?" And a lot more of the same. We watched some baseball and then as it got grey and cold we strolled.

The squirrels were fat, bushy and very tame. We looked at them and played with them for awhile; then I saw one that wasn't tame, but very frightened and anxious-looking, and consequently thin and underfed. I pointed him out and said that he was a neurotic squirrel and that he did not dare to get his share of the peanuts because he did not dare approach people. It was perfectly clear to me how his poor nervous system hindered him. I thought: "My goodness, he'd have a bad time if he were pregnant; in fact, he'll have a bad time surviving as it is." I thought of myself and what I was letting fear do to me. I said to myself: "You've got to learn to ride with things. If this is another loss you've got to accept that too; if you are shocked and frustrated occasionally; if it goes badly, you've got to handle it as you get to it. You can't walk through the next few months fearing what will happen; *you've got to let it happen first* and then handle it." I don't know why I felt so strengthened as I thought of all these things, but I did. We wandered down to the zoo and I laughed and joked with my husband about other things, then we had a cup of tea on the terrace and went on talking and laughing. Then we came home and I looked at myself—no trace of a spot, nothing pink, nothing of any kind, in fact.

September 26, 1942.

My husband and I decided to go to a show. I took one look at the program and realized that the play was going to be about pregnancy, and of course it was. It wasn't a bad farce, as a matter of fact, with an occasional laugh, and even one touching scene, but the last act developed about the *impossibility of getting a doctor* as a girl was giving birth to a baby, and it sent me out into the night shuddering. I could not bear it. I waited outside while my husband saw it through, and I don't think I have felt *such accumulated animosity* to the whole business of being pregnant at any time in the four months as I did in that fifteen minutes. I cursed everybody, you, and my husband, and the obstetrician, and myself, and every damn fool that is involved in this

absurd situation. I could see in all its colors the stupidity which got me into this third pregnancy in two and a half years, unwilling, unready and unconvinced. I walked up and down and by the time my husband came out of the theatre I hated him. He was desperately sorry that we had gone to the show and he wanted me to reassure him that it had not upset me. It *had* upset me badly, and I was damned if I was going to buck him up. I remembered the feeling that I had had in the morning as I drove away from the house in the country—I'd wondered whether I would ever see it again since between it and me stands this April delivery—and I could have screamed at him and at the whole world for what it doesn't know about the enduring of a pregnancy. I felt that if I opened my mouth at all I'd go all to pieces, so I kept my lips buttoned, did my exercises and crawled into bed.

I slept well and this was my dream. My cousin had guessed that I was pregnant and in alarm she had phoned Mother to ask her what she knew about it. Mother told Father [deceased] and suddenly I found myself being cross-questioned by Father and Mother as to whether this were really so. Then two other cousins and my grandparents all joined in the questioning. They were all horrified that I had gotten pregnant so soon; they were alarmed at the state of my health, and they were bitter about my obstetrician's allowing it. My husband and I kept denying it, saying that it wasn't true and that my cousin had been mistaken, but they were all very suspicious. They cross-questioned my husband and then the obstetrician, but both of them said that I wasn't pregnant. As this went on, and even as I kept assuring them that I was all right, I felt a certain justification in their alarm and anger. It pleased me in a way, because I felt that they were right. I felt that I had no business to be pregnant and that the scolding that my husband and I were getting was a just and fair one, and that they were showing the kind of concern for me that I had not shown for myself. Then I awakened.

The dream followed quite logically the events of the day, and the play that we saw, I think. I have simply put onto others my own feelings of shock and anger at being pregnant: *i.e.*, making it someone's else fault—that old devil, passivity.

Toward the end of the consultant's interview with the patient in the hospital the latter said: "Now I think I can go on and have this baby." The obstetrician gave her a fairly heavy dose of morphine to help her rest and relax.

The next morning at 4:45 a.m. a telephone message from the hospital reported that, although under morphine, the patient appeared to be in labor and about to deliver. When seen at 5:15 she said to the consultant: "If I had not had all that morphine I might have controlled it."

The personality history of this patient, which may throw some light on the medical history, is as follows:

Family history, personal data and health record essentially negative (which Colonel Hussey has commented should be termed *positive* because it is normal). The only factors to which attention might be called are:

1. Her father died of diabetes and hypertensive cardiovascular disease in 1941, just before the patient's second pregnancy (the first desired pregnancy).

2. Her mother is living and well, but somewhat crippled by a spinal scoliosis, cause unknown.
3. The patient grew up as an only child. Her older brother died during his first year, of an infection.

Under the heading of *general adjustment* it can be said that the patient's education, work level, income level, social relationships, and sexual adjustment had been good. Her attitude toward her family was disturbed by the necessity of helping to support her father or to borrow money for him during his periods of failure. She disliked her mother and she had a father-identification.

Her Rorschach test showed superior intelligence. Excerpts from the Rorschach report follow:

A moderate amount of creativity is expressed, but the patient is capable of more. Achievement is not commensurate with capacity because she lacks motivation, is weak in logic and has an obsessive-escapist tendency. She is decisive and has very definite opinions, is stubborn, difficult to reason with or to influence.

Ambivalence [that is, feeling opposite ways about the same thing] is apparent in her instinctive drives, as well as in many of her attitudes and opinions. Violent aggressive hostility alternates with extreme weakness and helpless passivity. . . . There is a strong sense of inner conflict and confusion accompanied by a feeling of being victimized by uncontrollable forces. With so introverted a personality there is some danger of an irrational acting out of conflicts because of this lack of perspective.

This last Rorschach prediction was borne out by her development of an accident habit after alleviation of her colitis, and in other ways. The report mentions "also a tendency to identify with the masculine rôle, combined with a strong hostility toward males, a tendency to fear and ridicule them. There is a suggestion of paranoia in this picture. . . ."

The analytic material provided considerable evidence of an introjected father, along with a strong father-identification, rejection of mother and rejection of the female rôle, which made it difficult to combine her professional interests with child-bearing and to live as a woman. This personality structure provided a fertile soil in which the statement made by her father: "This is a terrible thing; now you probably will never be able to have a child" took root and became effective.

This patient despised her mother because she was crippled and weak. She admired her father and tried to be like him, only to discover that in terms of his vocation, which she had chosen also as her own, he was a failure. As might be inferred, she was frigid.

Her father had been an unsuccessful novelist. She had completed for him the novel which he left unfinished when he died and the novel as completed by her had had a very minor success. During each of the first three pregnancies she had been

collaborating with her husband or attempting to complete a job which her father had left undone. Her husband was her father's best friend, and also unsuccessful. During the fourth pregnancy she was collaborating with him, and just before the premature delivery their joint manuscript was rejected by their publisher. Every time she became pregnant she was working on a manuscript and she was afraid that her pregnancy would interfere with the successful completion of it. To her, "writing novels is a man's job; a woman, especially one who bears children, cannot hope to be successful."

Immediately after the fourth unsuccessful pregnancy the patient wished to undertake a fifth. She was advised against this, pending the working out of her emotional conflicts. All of her pregnancies had started at the same time of the year. Recently at this time although she thought she had been careful about contraceptives, her menstruation was three weeks late and she thought that she had become pregnant. It appears that unconsciously she tried to become pregnant at times of the year associated with her father, even though the past summer her rational control prevented the actualization of the pregnancy. The delayed menstruation was normal and not such as to suggest pregnancy ending with spontaneous abortion.

After the last obstetric experience she wrote a novel of her own, apart from her husband or her father, which was published and was successful. Her reaction to this success was a return of colitis for two or three days, about which she commented: "Don't you see, it makes me sick to be better than Father, just as it makes me sick to fail like him." She then said: "If this really continues to be a success than I will be free from Father and from my husband—I will be an independent person; then I will be able to have a child." (By this she meant that she would be able to succeed independently of her father and of her husband—not that she wanted to leave her husband.)

In 1943 the impression was that the patient was correct in making this statement and that in one or two years it might be possible to say whether the pattern of unsuccessful pregnancy had been changed.³

SUPPLEMENTARY HISTORY

In 1944 the patient became pregnant again (not by accident) and refused to go to any obstetrician, but she asked the cooperation of her consultant in psychosomatic medicine to see that her prenatal

course was adequately checked and reported to her obstetrician whom she was not to see until she entered the hospital. The material relative to this fifth pregnancy is, briefly, as follows:

1. No colitis.

2. No panic or hysteria.

3. Brief reversion to the accident habit when she learned that her publisher was not quite satisfied with her newly finished book. (The reader might well review the recurrence of this theme in association with her previous misfortunes). Also, this implied rejection occurred at the time which she considered crucial for the continuation of her pregnancy because she had never carried a baby for more than 6½ months.

4. Significant dreams (which are reported for the benefit of the obstetrician or consultant who may be interested in the persistence of behavior patterns) indicate that, although the patient had had sufficient treatment to protect her against panic and colitis, she had a hangover of her fear of being let down by her obstetrician and of losing her baby.

Second Month. One night, in the second month of this fifth pregnancy, she had a terrible nightmare. She had dreamed that she was bleeding profusely and that she jumped out of bed and ran into her husband's room, crying out in panic: "I am bleeding." He asked her what was the matter and she replied that she was pregnant. (She had not dared tell her husband that she was pregnant until he finished the chapter of the book on which he was working.) Then, in the dream, she went into the bathroom and dived head first into the toilet and blood was spattered all over the bathroom. When she emerged she noticed that one side of her face was paralyzed. At that point she awakened and asked herself: "Am I going to act this one out too?" She reported that after that she was relaxed and that she felt fine the next day.

The dive into the toilet and the paralysis of the face were related to her father who was a toilet-sitter and had had paralysis of the face. Also, according to the patient, he was a great baby.

Third Month. In the third month of the pregnancy she reported another bleeding dream. This time, in the dream, she wanted badly to urinate so she lay across a large washstand in the bathroom and was urinating blissfully when she noticed that the basin was full of blood. She called for help and a nurse came. Then she knew that she was bound to lose the baby. She looked down at her stomach and thought: "Well, it'll be thin now, and what does it matter? What a sad thinness it will be!" The she awakened.

³ As reported in Detroit.

In another dream reported two weeks later, after one brief interview with her consultant, she was taking care of a feeble little kitten which she was trying to keep alive. She did not know whether she had given birth to it or not, but she thought that she had. Her two doctors were there, but they did not help. She said that in the dream "I suddenly realized that the kitten had been injured in being born and I was glad that the doctors were there, but I knew that *I was the only one who could keep it alive.*"

This dream was significant because it suggested that for the first time the patient realized that, while it was good to have the doctors there, she alone was responsible for keeping her baby alive. Also, the dream was favorable for a continuation of the pregnancy because it showed that the patient was willing to assume this responsibility. The outcome, however, might be expected to depend on many factors, among which her ability to evaluate impacts from the outside would play a major rôle.

Fourth Month. In the fourth month of this pregnancy the patient dreamed that she was in the living room of her apartment and two friends came out of the kitchen. She said that, in the dream:

They had done me some service, I don't know just what, but it was vaguely medical—they had bandaged something or healed something for me, and I was very pleased with them. I said to one (the larger and older of the two, who vaguely resembled my husband in some ways): "How about being my obstetrician when the baby comes?" He said, no, he was too busy. I then asked the other. They both said they couldn't, but pleasantly and smiling, and then *just as they were leaving* [Note from previous material: Doctor always leaving at the critical moment], the older one said: "Well, if you can't get anyone else, call me." They left and I went back to my bedroom saying: "This is a hell of a fix; here I am pregnant and not an obstetrician to be had." I could not think of the name of one, or even of a friend who knew one. Suddenly I remembered my own obstetrician's name and the way he looked. . . . I said: "He is a good obstetrician, but he is so far away; well, I will have to see." That is all there was to the dream. I send it along because it will tell you more about my feelings about my obstetrician than I could even consciously tell you—more than I consciously know. I wish I knew a nice Irish policeman who was a good obstetrician.

A week later the patient dreamed that she was on a raft in the middle of a lake. The raft could not be moved to one side or the other and she could not swim well enough to jump off and get to either shore. Finally she reached the place from which she started. Then she awakened with a paralysis on the side of her face that corresponded

with the paralysis her father suffered (see p. 167), and a little diarrhœa.

Fifth Month. The patient's reaction to the baby was that it was a dominant something in itself and no longer controlled by her, and she lost interest in it. Her consultant said that if she insisted on conscious control of everything that went on inside her, it would include careful thought about each breath that she took. The patient thought that was a dramatic analogy and that of course you should not *expect* to control the baby any more than you would *want* to control consciously every heart beat or every breath.

Two days after this her publisher told her that he thought her book was pretty good but he could not publish it immediately. That night she dreamed that she went to a party but that she had to go to the hospital first to have her baby. Then she was on the couch at the party and she asked her husband to tell her about the baby. He said he did not know. She asked him if the baby was born dead and he said, yes, and they both cried. Then she awakened.

In connection with this dream she said:

"This is nonsense; my writings are not born dead and this will not be either." She wondered why the fear of death hung over her so heavily. Then she said she knew—when her husband felt happier, she felt this dread. She said: "There must be guilt in it, uneasiness in the feeling that I am trying to do something to our baby that I know will cause him pain. I don't think it is so much murder⁴ that is being worked off as it is an unconscious estimate of what my weak ego might let happen to my own baby, if I am not careful. I feel the weakness, and the passive side of me, in giving birth, more than I fear the upsurges of any murder that still might linger down in the depths. And there is a confusion in me because I hear you telling me to be relaxed, . . . more giving-in to the experience. You say: ['Let the baby do his share, don't try to do it for him.'] But that gets translated within me and I transform it into an image of my own weakness . . . and I feel the baby establishing its authority over me—then I have the falls (recurrence of the accident habit). I still have difficulty in bringing together the image of a woman who is relaxed, quiescent, and yet active and strong. . . . I had it for a flash this morning when I awakened from the dream that had such terrible sadness in it; I woke and said quite firmly: "That is not true—it is not going to be that way—my work has life and my child will have life. But the things you say consciously are a small part of it . . . my best companion these days is my tummy. I could lie for hours and feel it jump and pop. . . . Its activity is wonderful, comforting, a great pleasure to me." She said she had heard women say that they missed their babies after they were born and now she understood that perfectly: "Pregnancy is the final companionship."

⁴ Cf. earlier pregnancies during which murder was prominent in her thoughts.

Seventh Month. A letter which is headed: "Today starts the seventh month of pregnancy" begins with a description of her husband's symptoms rather than her own, of which there were practically none to report. It was written after a walk through a neighborhood fraught with unpleasant memories, past the house from which her father was buried, and the office of one of the obstetricians who had "let her down." Excerpts from the letter follow:

It was that night and the succeeding days that I began to wonder about dying in childbirth, what my husband would be like, if the child would live, how much of my book I could finish before I died, and if there would be enough of it done so that it could be finished after my death [Note: Finishing the father's book after his death], and all the rest of that fantasy. My side of it isn't interesting, but his side is what I want to write about.

I think he has a number of divisions on the subject. . . . In the first place he feels that a man who has a child should have some certainty of being able to support it by his own work. He has no such certainty because he fears and mistrusts his own work. It embarrasses him to think that to so large an extent we live on the income left by a family which he despised. He thinks that a child will require of him certain adult attitudes and behavior, will limit his excursions into irresponsibility . . . and he hates that. He knows that I want the child and, not only that, but want it *out of him*, and he feels a little as if it had been taken from him when he wasn't looking. He feels deeply committed to a very responsible kind of life, by the having of a child, and it scares him. . . . He has said a hundred times that my treatment has been a *double cure*, that you have done him as much good as you have done me. . . .

I think that in his deepest thoughts he wants my child as much as I want his, and I think he will be angelic to the child, once born. But when it looks hard, when he wonders about himself as a breadwinner, when he sees me intent on my own work, then I think the hot murderous wave goes through the blood stream and he wonders if I might die in childbirth, and would that, after all, be simpler.⁵

Eighth Month. One morning in the eighth month of her pregnancy the patient called the consultant and reported that she was having slight cramps, but otherwise she was feeling well. She was told that probably these were the usual eighth month pains and she should relax and take a small dose of seconal.

When she reported at noon that the cramps were better but that there was a slight pinkish discharge, her consultant suggested that she come to the office, which she did at 3:30 in the afternoon. The consultant sat for a little while with her hand on the patient's abdomen and noted that she was having

painless contractions at intervals of 6-8 minutes. After a telephone conversation with the obstetrician it was decided that it would be advisable for the patient to go to the hospital as it was thought that she might be going into labor. It was explained to her and her husband that she would be better able to rest there and that *the baby would be more comfortable*. Also, she was told that she might, or might not, deliver that night and that if she did the baby probably would live.

The patient and her husband went by train to the hospital and on their arrival she was examined by her obstetrician who thought that the chances of her delivering that night were fifty-fifty.

The consultant had four reasons (all related to psychic transference) for thinking that the patient might deliver at this time, all of which fitted into her pattern of reaction:

1. It was the day before her first appointment with her obstetrician during this pregnancy, and she had just made up her mind to see him;
2. It was a week after she learned that both of her doctors had been away for a few days;
3. She had called her consultant early in the morning and could not reach her because the latter was on her way into town;
4. She had had dinner the night before with exactly the same people with whom she had dined just before the preceding premature delivery, and she had relived an unhappy episode connected with her book.⁶

⁵ Concerning this the patient wrote: "Anticipating a quiet evening alone with two old friends, I dressed loosely and comfortably and went down there to dinner. The girl opened the door for us. It was the first time she had seen me since she had known about the pregnancy. Her eyes fell on my tummy, she welcomed me heartily and happily, but she could not keep from her voice that anxious note as she inquired about me, how I felt, etc. As they took my wraps I saw that the dining table was arranged for buffet and I was instantly alerted. I asked who was coming. Ten people were invited, and to the last man they included everyone who had come to a similar dinner two or three days prior to my last miscarriage. Among these were two men who like and admire me and who have only seen me rather carefully turned out. I remained seated as people arrived, but the party did not go very well, and I was conscious of "pumping" talk. One of the women with a bad record of miscarriages and two premature babies sat beside me for a long while. She had come to see me in the hospital during the one day that the second baby stayed alive, to encourage and cheer me. . . ."

"By the time we got home I was conscious of being very tired and of having had a heavy evening. I had a slight tummy ache and a little heartburn. I wondered what I'd eaten that gave me the tummy ache, but I couldn't remember anything special. I resolved to tell my doctor the next day about the indigestion, but then I thought it didn't matter enough and I'd get over it as I had the diarrhoea a few days before."

⁶ After the successful delivery the husband sent notes to the consultant confirming his wife's impression of his feelings about the pregnancy.

On her arrival at the hospital at 6 p.m. the obstetrician gave the patient 0.1 gm. seconal and 100 mg. demerol. At 8 p.m. pains became severe and he called the consultant. The patient cooperated well and when she had a bad pain she recalled that her consultant had told her to relax her diaphragm, so she concentrated on that. During a rectal examination she had a sphincter spasm, but as soon as she realized it she said to her obstetrician: "I think I can help you," and relaxed. (See history of colitis in this patient.)

At 9 p.m. the membranes ruptured with a big explosion (again note colitis pattern), immediately after she was told by her obstetrician that she was going to have the baby that night. When the consultant arrived the patient was in the delivery room and conscious. The baby was occipito-posterior and the obstetrician chose not to rotate it and to do instead a deep episiotomy to avoid pressure on the baby's head. There still was a tendency to explosive delivery, and to avoid this the anesthetist cooperated expertly by means of nitrous oxide alone, thus safeguarding the immediate status of the newborn.

When the patient was "going under" she muttered: "Let *her* (meaning the girl baby she wanted) live," and later when she was conscious she said that that was what she was thinking about. When she was told that she had a fine baby girl she could not believe at first that the baby was alive and that it was a girl which, it will be remembered, was what both she and her husband wanted.

Three days after birth the baby weighed 3 pounds, 9 ounces, so at birth the weight probably was slightly more than that. Its reflexes and general development were a little more than average for the duration of gestation. The mother was especially impressed by her having quite a lot of hair, eyelashes, fingernails, and a well-developed nose.

When the baby was 3 days old the mother was taken on a stretcher to the nursery where she and her husband were introduced to their daughter. The baby's reaction to meeting her parents was a prodigious yawn and the father said: "I hope she won't feel that way about us all her life." The mother's first comment was: "Why she's beautiful—she's a person." The father's remarks are equally interesting. He said: "Why, *it* has eyes and a tongue; does it have hands and feet?" and then, surprised, too, that the baby really was a person, he said: "In a little while it will be grown up enough to be buying books and criticizing us and what we do."⁷

⁷ Cf. n. p. 169.

The baby has developed extremely well and both parents are very happy. They have begun to realize that, after fifteen years, having succeeded in producing a live baby, there is still the problem of adjusting to parenthood, which they appear to be doing very well. Moreover, should the baby encounter any difficulty, better medical care will be assured by virtue of the pediatrician's knowledge of the foregoing history.

A not unimportant conclusion to this history is the fact that the patient recovered from her frigidity. After the postpartum examination, which indicated that her pelvic condition was normal, she was told that she might resume coitus. During the first experience she remained frigid and this was discussed with her consultant. The second time she achieved orgasm and her subsequent history has been completely satisfactory in this respect. When she reported her first experience of orgasm she said: "I never understood what you meant when you talked about the involuntary nervous system and conscious control⁸ but I remembered it during the labor pains and I think it was the experience of labor that taught me how to let go. When I thought about that I was no longer frigid." She added: "I feel sure that I shall carry my next baby for nine months."

Mrs. Z

CLINICAL REPORT

Mrs. Z, aged 29, after one year of her second marriage, became pregnant while accompanying her husband on military duty in another section of the country. The last menstruation had begun February 20, 1941, and the expected date of delivery was November 27th. At the suggestion of her consultant in psychosomatic medicine, she wrote to her obstetrician asking him to assume ultimate responsibility for her. Several letters were exchanged with the obstetrician during the first four months of pregnancy, before she planned to return to New York for final obstetric care and delivery. Apparently she did well, as confirmed by the local physician who attended her.

The obstetrician first saw her on August 18th, toward the end of the sixth month of pregnancy. Her history was normal, except that eight or nine months previously she had had cystitis which subsequently recurred several times when she became fatigued, but not during the pregnancy. She also had a history of difficulty in hearing. She said that she had had an operation "to burn out the Eustachian tubes," and that the diagnosis had been

⁸ Cf. Notes of fifth month.

pronounced otosclerosis. Her tonsils and adenoids had been removed some years before.

Physical examination revealed the patient in good condition. The pregnancy seemed normal in all respects. The fetus presented by breech and was easily changed by external version to cephalic presentation, which remained thereafter. From August 18th through November 18th the patient was seen by her obstetrician eight times in his office. All findings were normal, except that on three occasions she had a trace of sugar in the urine. The pelvic measurements were clinically typical of a normal gynecoid pelvis except that in the mid-pelvis the sidewalls were slightly convergent and the sacrum was sharply angulated forward. Subsequent x-ray examination of the pelvis confirmed that it was gynecoid and normal.

On November 25th, two days before the expected date of delivery, the patient spontaneously ruptured her membranes. She was admitted to the hospital at 4:20 a.m. the next day, but it was not until 1 p.m., approximately eleven hours after the membranes ruptured, that the patient began labor. By 3:30 p.m. she was in sufficient pain to need analgesia. Through a Levin tube passed through the left nostril into the stomach 15 c. c. of paraldehyde in 20-30 c. c. of water was introduced and retained. Diplopia and inebriation ensued within four minutes, and then euphoria, smiling and soft laughter occurred for about 10-15 minutes without abatement of the uterine contractions. The patient fell asleep at about 4:15 p.m., and continued having moderately weak contractions every 3-5 minutes. By 8:15 p.m. the cervix had dilated to 4-5 cm. and was thin, and the patient was comfortable again, with strong contractions every 2-3 minutes. She was given 15 c. c. of paraldehyde in sips through a glass tube and she became more quiet, but she was softly talkative during contractions, although asleep between them. By 9:45 p.m. the cervix was completely dilated.

After a second stage of one hour and forty-five minutes and a total labor of ten and one-half hours, delivery was done at 11:25 p.m. by easy, gentle, low forceps, with median episiotomy. The child was a male without obvious malformations or trauma, but pallid and apneic. Weak heart action continued for forty-five minutes, but not a single respiration occurred despite the following methods of resuscitation: artificial respiration, warm bath, coramine, and Flagg intubation into the trachea. The child weighed 3050 gms., or approximately 6½ pounds.

The cause of the stillbirth has not been deter-

mined to the satisfaction of the obstetrician. The amount of paraldehyde which the mother received was very small and at adequate intervals. The obstetrician had used it with hundreds of other patients, usually in larger and more frequent doses, without any detrimental effect on mothers or babies. A complete autopsy revealed no positive findings except for a considerable hyperemia and congestion of the lungs of which the mucosa was intact and well-preserved, without evidence of inflammation. The analysis of the brain revealed paraldehyde content of 0.25 per cent, corresponding to about 2-plus alcohol. These findings alone—and they were the only positive findings of any significance—do not, in the authors' opinion, explain why this baby failed to breathe and could not be resuscitated.

The postpartum course of Mrs. Z in the hospital was uncomplicated, except that on the morning of the third day she complained for 20 minutes or more of palpitation and a feeling of flutter in the chest and weakness. Examination revealed a pulse rate of 210 per minute. The patient obviously had paroxysmal tachycardia. It ceased spontaneously and did not recur. The blood pressure remained normal.

At postpartum review, December 17th, the patient was in good condition, including her psychologic status. The obstetrician saw her again two weeks later, when contraception was prescribed.

A second pregnancy followed soon. The patient saw the obstetrician on March 12, 1942, with a history and findings of early pregnancy. The last menstruation had begun February 11th, making the expected date of delivery November 18th. From then on, as ascertained in seventeen visits to the office, this patient's course of pregnancy was normal in all respects. In October she was tested for reaction to scopolamine, in view of a plan to employ that drug for analgesia at the time of delivery. The consultant accompanied the obstetrician to the patient's home where they gave her a small dose and observed that she reacted normally to it. Also in October she was started on a regimen including vitamin K. In one visit to the obstetrician at the end of October her urine contained a trace of sugar. On October 28th the fetus presented by breech. An external version to cephalic presentation was easily done and that remained. The Wassermann reaction in this pregnancy, as in the preceding one, was negative.

The patient was fearful that the approaching labor and delivery would repeat the tragedy of the first one. She was persuaded to undergo induction of labor at a time convenient to her and to her two

physicians, so that she would have full and continuous attention. Accordingly, nine days before the expected date of delivery she was admitted to the hospital at 8 a. m. At 9:07 a. m. the membranes were ruptured surgically by means of a small hook introduced through the cervix. An hour and one-half later weak uterine contractions began. At noon the contractions were still weak so the patient received one minim of pituitrin injected intramuscularly, with slight improvement in contractions. This injection was repeated at 2:30 p. m., whereupon very good labor ensued. At 3:27 p. m., after approximately five hours of labor, easy delivery was done by low forceps and a small median episiotomy to protect the perineum and the small baby.

It is interesting that no analgesia was used and none was requested. Late in her labor the patient remarked: "I wish I knew why I don't want relief from pain." She was really uncomfortable for only about forty minutes before she was anesthetized by nitrous oxide alone for the actual delivery. It appeared quite convincing that the consultant, by her presence and cooperation during labor and delivery, facilitated the patient's progress and therefore the obstetrician's success.

When the patient roused from the anesthetic enough to talk she was told that the baby was in excellent condition and that it was a girl. She began to cry because she had wanted a boy. The baby weighed 2820 gms., or 6 pounds, 3 ounces.

The subsequent course of the mother and the child was excellent, both in the hospital and at home. At puerperal review on December 15th, findings were normal. She was seen again December 29th for a final review. It was found that her left ovary was a little enlarged, and this was still the case on March 21st following, but by May 23rd the ovary had reverted to normal size. Probably it had had a cystic corpus luteum which had finally disappeared physiologically. The patient was not at any time informed of this finding lest it worry her.

PSYCHOSOMATIC SURVEY

This patient, aged 29, married at the age of 21, divorced, and just remarried, was referred because a "pseudo-analyst" whom she had seen during her first marriage had told her that she "was too sick emotionally to have a child." His statement had been reinforced by an otologist who told her that she had otosclerosis and that she would become completely deaf if she became pregnant. It was

impossible to accept her as a patient at that time so she was asked to have a Rorschach test as a help in evaluating the first clinical impression.

According to the Rorschach report this patient, like Mrs. Y, was of superior intelligence. The following are excerpts from the report:

The subject is strongly introversive, having very limited affective contact with the outer world. She would like more contact, but is afraid to express her feelings; she is very cautious and guarded in her relationships. She acts somewhat like a "burnt child" who has been hurt in earlier experiences in which she let herself go spontaneously, and is afraid to do so now. She certainly wants rapport, but feels that she must be overadaptive, and cannot be her spontaneous self in order to get along with others. There is a male-female complex.

Her inner life is dominated in an infantile way by strong instinctive drives which, however, find little release or satisfaction because of her repression of her emotions. She suffers a good deal of anxiety and an acute sense of inner conflict. Some of the anxiety is rationalized; some is experienced as critical introspection and depressive feelings of inadequacy; some is diffused and "free-floating" in quality, making her feel very confused and helpless. Her obsessive-compulsive tendency to escape, her failure to organize her thoughts and feelings, and to face their reality, combined with her emotional withdrawal from the outer world mean, of course, that she has little persisting self-understanding.

This Rorschach test clearly indicates two sexual traumas, the second of which is a kind of repetition and elaboration of the first.

The patient when first seen had given up her career as a musician and was working as a model. She was 5' 8"—a "perfect 14." She had what the referring physician called "exotic black hair," and she had considerable claim to beauty, except for closely set eyes and a personality which, on first impression, suggested Ophelia.

She was the fifth child (first girl) in a family of six, one of whom (an older brother) had died in infancy. The mother was an amateur musician and the father was a broker in Wall Street. Because girls were "not supposed to go to college," she graduated from a leading music school with high honors, after four years' attendance. While at this school she was raped by one of her instructors. She married her first husband shortly thereafter because he was "so romantic." He would call for her at night and take her away to the underground caverns of a secret society which no woman was supposed to enter, and there make love to her. Subsequently her lover felt guilty about this and confessed to the officers of the society. The penalty required was that she go through certain somewhat traumatic initiation rites, then make a complete confession before the whole society of her recent,

as well as her previous, sexual experiences. Under such circumstances a girl of 20, questioned about masturbation and other secret matters, is readily traumatized. She left the scene more than ever confirmed in her dislike of men and, as she then thought, purged of all interest in sex for the rest of her life. She went on to marry this man, not because she could any longer be in love with him but in order, as she thought, to keep her self-respect.

The man whom the patient married was a patient of the "pseudo-analyst" whom she later consulted on his advice, and apparently the analyst became considerably involved by taking sides between husband and wife. That marriage ended in divorce within a year.

Six years later the patient married an artist who had recently become an officer in the army. She immediately went into a panic and consulted the specialist in psychosomatic medicine. During the first few interviews with the consultant the patient was extremely tense, spoke almost in a whisper and was unable to hear anything that the doctor said. Gradually, with no analytical interpretation of this symptom, she began to speak and to hear normally. Her major difficulties were hatred of her mother because her mother preferred the younger sister, and a desire to be a boy in order to compete with her brothers for her father's affection.

Before she went to music school she had acquired a considerable reputation as a tomboy, which many people thought was incongruous because of her delicate skin and her extremely feminine appearance. Unlike Mrs. Y, this patient had severe dysmenorrhea, usually preceded by nightmares associated with bleeding to death during childbirth. She improved rapidly during a brief period of treatment, although the transference situation was very difficult because of her rejection of her mother, her ambivalence toward her father and her brothers, and particularly because of her first husband's unfortunate experience with the "pseudo-analyst." When treatment had to be interrupted because of her husband's transfer to another part of the country she was told that pregnancy probably would not make her deaf, but that it would be well to wait until she had worked out some of her emotional problems. Nevertheless, she became pregnant in March and immediately began to gain weight, which worried her, and she went to bed.

During the third month there was some bleeding, but when she was seen in August by the obstetrician there were no adverse physical findings and

the pregnancy appeared to be normal. Because of her husband's financial situation it was necessary for her to live out of town with her family so she was not seen by the consultant until November, four days after the birth of a baby which was normal in every way except that it could not be made to breathe. She was seen at the hospital at this time by the consultant because of an attack of paroxysmal tachycardia.

The patient then decided to resume psychosomatic treatment, but because of financial and geographical difficulties she was seen less frequently than was desired. She became pregnant again in February 1942 and the course of this pregnancy was essentially uneventful. There was little incapacitation from fatigue, almost no nausea and no bleeding.

Because of this patient's previous history, the obstetrician decided to induce labor on November 9th instead of waiting until EDD, which was November 18th. This was done with the permission of the patient and her husband. The subsequent course of labor has been previously described. At one point the patient, who was in good spirits and cooperative, said to the obstetrician: "When am I going to have my baby?" He answered lightly: "Oh, I think before New Year's." Her reaction to his reply was a complete blacking out, and all cooperation ceased. The consultant, having been informed that the cervix was 4 cm. dilated, and observing the nature of her contractions, quickly said: "In a half hour or forty minutes; relax, use all your strength now because it will be better for the baby if you do not have to have an anesthetic." The patient, surprised, became alert and the baby was born in forty minutes. She was given nitrous oxide for the last five minutes and was unconscious for only eight minutes. When she was recovering consciousness she was told that she had a healthy baby daughter. She burst into tears and said: "All that for a measly girl!" Her recovery was quick and uneventful.

Neither of the two pregnancies affected her adversely, and after the second (successful) one she ceased to complain about her hearing. Objectively, her hearing was essentially normal, as determined by a prominent otologist who, he it noted, had examined her previously, had treated her ears for ten years, and who could now scarcely believe his own ears.

When, after six weeks, the patient was told that she might resume coitus with her husband she found that she was frigid. Analysis of this symptom does not belong in the context of this paper, al-

though the consultant has been impressed by the frequency of frigidity as a symptom following successful childbirth in women who have had a deep conflict about childbearing.

PSYCHOSOMATIC SUMMARY

1. Both of these patients were of superior intelligence; both scorned their mothers and identified themselves with their fathers; both were frustrated in their careers; both were frigid (although both recovered after adjustment to parenthood); and both were concerned about the sex of the baby. These four factors have been found in a number of other patients who have the pattern of abortion, premature delivery or stillbirth.

2. Both patients had pathology or a physiological variant, although of questionable significance. In the first case the discovery would not have been made without the appendectomy. In the second case the lesion disappeared without surgical intervention and without the patient's awareness of its existence. The obstetrician commented that this is an interesting example of physiology which often was misinterpreted by the older school of surgeons who relied on, and practiced, extirpation.

3. Both patients had bleeding and gastrointestinal symptoms, including nausea, vomiting and colitis, during earlier pregnancies, but these symptoms were notably absent in a later pregnancy during psychosomatic treatment.

4. Whatever may be the internal or external agents predisposing to abortion, it appears from these histories and from other unpublished material that some persons develop an abortion habit just as others develop an accident habit, and that this habit may be interrupted by well-directed psychosomatic treatment.

CONCLUSIONS

The obstetrician in this study gained some impressions that probably will be shared by most obstetricians who are exposed to this or similar material:

1. The province of the consultant in psychosomatic medicine is unfortunately very foreign to most obstetricians. The consultant examines large areas of the patient's emotional and physical functioning which, if even suspected by the obstetrician, have been left untouched, unexplored.

2. Those areas are related to conception, pregnancy and delivery in ways that are likely to sur-

prise the obstetrician. This surprise may be instructive or may occasion mistakes.

3. An obstetrician should weigh what he says to his patient. His verbal contact, like that of his mechanical and sterile technique, should not be neglected lest it traumatize her.

4. There are suggestions that some of the clinical phenomena (such as nausea and vomiting, and some instances of bleeding) which puzzle obstetricians because they do not understand them can be elucidated and relieved by the approach and technique of the consultant in psychosomatic medicine.

5. Obstetricians should cultivate the psychosomatic approach to their work, and furthermore should seek instruction from and collaboration with those who are already proficient in that technique.

6. What may be called *psychosomatic obstetrics* can now be discerned only in shadowy outline, but there is promise of substance, precision and great utility in time to come.

These two cases alone, although the two personalities do have a good deal of similarity, suffice to illumine a number of obstetric points. It is probable that the study of other women of different types would yield rich correlation between the personality and the pattern of labor. Additional cases could be cited in demonstration.

7. On the basis of material not presented here due to lack of space, it appears that correct psychosomatic management of the mother may influence the neonatal development of the infant. It is of interest, for example, that Mrs. Z's infant daughter created for the attending pediatrician a considerable problem because of colds, nausea, vomiting, and colitis, necessitating diverse changes in formula during the first four months of her life. During these four months the mother continued psychosomatic treatment and came gradually to accept her girl-child and to look forward to another pregnancy. Meanwhile she recovered from her frigidity. Since that time the child has been in the best of health, with no signs of physical dysfunction. The pediatrician, the consultant in psychosomatic medicine and the obstetrician, all have reason to believe that the mother's solution of her own emotional problems was largely responsible for the change in the health and behavior of the child.

8. It may be added that a new form of cooperation between obstetrician and pediatrician is indicated. A psychosomatically sensitive obstetrician is in a position, by the end of a patient's pregnancy, to pass on to the pediatrician who is similarly sensitive,

data (indeed a personality profile of the woman) that can be utilized by the pediatrician in his care of the infant in cooperation with the mother. This bridge of information may be especially valuable if the child is the first one in the family and if therefore this is the first contact of the pediatrician with the mother.

Observation of the infants described here, and of many others, shows a marked difference in the health record of the child, depending on whether

the mother succeeds in attaining psychosomatic adjustment and equilibrium after delivery.⁹

⁹ If a larger series of obstetrical cases were studied the mathematical necessities for the proof of causal relationships and associated phenomena should be indicated under four categories of individuals: (a) Women with good personality adjustment who abort; (b) women with good personality adjustment who do not abort; (c) women with poor personality adjustment who abort; and (d) women with poor personality adjustment who do not abort. As stated at the outset, this is a purely descriptive, not a statistical, paper.

THE EASTERN ASSOCIATION OF ELECTROENCEPHALOGRAPHERS

Twenty-seven prominent civilian and military electroencephalographers from several different states met at the Graduate Club of the Institute of Living in Hartford, Connecticut, on Friday, March 1st, 1946, to organize the Eastern Association of Electroencephalographers. Formed for the purpose of promoting research in the field, the Association plans to pool scientific information concerning the neurophysiology and clinical application of electroencephalography.

Lieutenant Commander Robert S. Schwab, MC, USN, of the United States Naval Hospital in Boston, was elected Chairman of the Association, and Dr. Charles W. Stephenson, of Hartford, was elected Recorder.

One of the immediate projects of the group is to approach the American Physiological Society, the American Neurological Society, the American Psychiatric Association, and the Council of Physical Medicine of the American Medical Association, on the matter of establishing a joint-committee among the several organizations for the purpose of considering the desirability and means of establishing minimum standards for approved Electroencephalographic Laboratories. Chairman of the committee appointed to pursue this project is Dr. Hallowell Davis, Associate Professor of Physiology at Harvard; members are Dr. Paul A. Hoefer, Associate Professor of Neurology at Columbia University, and Dr. Margaret Kennard, Assistant Professor of Neuropsychiatry and Neuroanatomy at New York University.

Dr. Wladimir T. Liberson, Director of the Physiological Research Laboratory at the Institute of Living, Hartford, and Professor at École des Hautes Études in New York City, was appointed Chairman, and Dr. Leslie F. Nims, Assistant Professor of Physiology, Yale University, and Dr. Margaret B. Rheinberger, who is in charge of the Electroencephalographic Laboratory at Montefiore Hospital in New York, were appointed members of the Organization and Program Committee.

PSYCHOENDOCRINE RELATIONSHIPS IN PSEUDOCYESIS

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Pseudocyesis has always involved much medical speculation. Bivins (1), in 1934, collected reports of more than 400 cases from the medical literature of the entire world, dating back to the time of Hippocrates. Many synonyms for this clinical entity have appeared in the literature; spurious pregnancy, false pregnancy, imaginary pregnancy, "gros-sesse nerveuse," etc. The terms have often been used rather loosely, and have covered a number of conditions which cannot be considered as true cases of pseudocyesis.

Dunbar (3) defines pseudocyesis as "a condition in which a woman firmly believes herself to be pregnant and develops objective pregnancy symptoms, in the absence of pregnancy." She differentiates it from the following conditions: (1) hallucinatory pregnancy, which occurs in the psychoses; (2) simulated pregnancy, where the patient professes to be pregnant, knowing she is not; (3) pseudopregnancy, caused by tumors which give rise to endocrinological changes suggestive of pregnancy (7, 15). Some authors (8, 9) state that pseudocyesis occurs mostly in newlyweds and in women near the menopause. Others (14, 16) feel that its incidence is not so restricted. The etiology has been paradoxically ascribed to a desire for pregnancy and to a fear of pregnancy. The classical case history usually involves a woman of neurotic tendencies, near the menopause, who has had no children and strongly desires a child. Other cases occur in younger women who have had illicit intercourse, and fearing pregnancy, are convinced that they are pregnant. These patients present all the symptoms suggestive of pregnancy, including morning nausea and vomiting, amenorrhea, enlargement and tingling of the breasts, milk secretion, areolar pigmentation, and enlargement of the abdomen. The symptom complex is carried through so convincingly that in many cases (5, 10) the patient apparently comes to term and the error is not realized until labor is unproductive.

There has been much speculation as to the mechanism involved in the development of this interesting condition. The subjective symptoms are easily explained, but not so the objective signs. In her excellent book on psychosomatic interrela-

tionship, Dunbar (3) has pointed out that virtually any group of symptoms and signs may develop as a result of disturbances in the sphere of the psyche. Even such organic illnesses as peptic ulcer, colitis, cardiac disorders, etc., may arise as the result of derangements in physiological processes caused by emotional upsets.

The purpose here is not merely to report additional cases of pseudocyesis, but rather to present evidence of the effect of the psyche on the endocrine system. The demonstration of marked alterations in the excretion of gonadotropins and estrogens as a result of psychogenic influences offers a more satisfactory explanation of the mechanism involved in pseudocyesis. This mechanism may operate in the production of menstrual disorders (12, 13).

During the past three years, three cases of pseudocyesis were encountered and studied. In addition to a complete history and physical examination, quantitative 24 hour urinary estimations of gonadotropins and estrogens as well as Friedman tests were performed.

CASE REPORTS

Case 1. Mrs. E. M., age 23 years, white, was referred for a pregnancy test. She had been attending a prenatal clinic for two months. Menarche occurred at 14. There was a regular twenty-eight to thirty day cycle. The flow lasted three or four days and was painless. For the four months previous to her initial visit she had vaginal staining lasting through part of one day at monthly intervals. During these four months she had gained 21 pounds in weight. Her configuration was typical of a four to five months' pregnancy. The abdomen protruded and a definite lordosis was present. The patient had a characteristic waddling gait and her appearance was so suggestive of pregnancy that she was discharged by her employer. She herself was convinced that she was pregnant, despite the doubt raised by her physician. At her regular prenatal visits she complained of morning nausea and vomiting. She stated that she "felt life" two weeks after the initial visit. Her breasts showed considerable enlargement, increased areolar pigmentation and Montgomery tubercles. A colostrum-like fluid could be expressed from the

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prominent nipples. Pelvic examination revealed a soft cervix. The fundus could not be outlined because of the adiposity. The Friedman test performed five months after the cessation of normal menses was negative. However, the possibility of pregnancy was not dismissed. An occasional case of pregnancy had been previously encountered, in which the Friedman test had been negative as late as the second trimester, in the presence of pituitary hypofunction. It was probable in these cases that the gonadotropins were not elaborated in sufficient amount to give a positive Friedman test. It was believed that this patient might fall into this category. Accordingly, a 24 hour specimen of urine was assayed (17) for gonadotropins and estrogens two weeks after the negative Friedman test. Eighteen hundred rat units of gonadotropins and 3000 rat units of estrogens were excreted. On the basis of the history and assay it was felt that she was pregnant, and she was referred back to the prenatal clinic. Two weeks later another pelvic examination revealed no further change. She continued to gain weight and stated that she continued to feel "quick thumps" in her abdomen. She complained of painful breast and severe muscular cramps in the lower extremities. Her face, hands and feet were edematous. Blood pressure and urinalysis were normal. A roentgenogram of the abdomen revealed no fetal structures. Another assay, done four weeks after the first determination, showed an excretion of 1200 rat units of gonadotropins and 200 rat units of estrogen per diem. A pelvic examination done at this time revealed no change. At this time the patient was informed that she was definitely not pregnant. Although very much upset and depressed, she resigned herself to the situation. Within one week the subjective symptoms of pregnancy cleared up, and the objective signs began to recede. One week later a hormone assay showed 600 rat units of gonadotropins and 300 rat units of estrogen per 24 hours. She was then treated as a case of hypopituitarism of the Froehlich-type with an associated amenorrhea. The patient was given 10,000 rat units of estradiol benzoate twice weekly for four injections, intramuscularly, followed by 10 mgm. of progesterone every other day for five injections. Slight vaginal bleeding followed. After the cessation of bleeding, daily injections of 300 international units of gonadotropic factor from pregnant mare serum and 500 international units of the gonad-stimulating hormone from pregnancy urine were given during the first half of the cycle for two cycles. She was also placed on a weight-reduction regimen, and

given 60 gr. of enteric-coated ammonium chloride daily, and 5 mgm. of benzedrine sulfate three times a day, one hour before meals. During the following month she menstruated and the flow lasted two days. In the next eight months menstruation occurred regularly every month with a three to four day flow. She lost 24 pounds and her body resumed a normal configuration.

Case 2. Mrs. C. R., aged 37 years, white, was referred because of a possible pregnancy. During each of the previous two cycles, there had been one day of staining instead of her usual three-day normal flow. For the past three weeks she had experienced morning nausea. As a result, the possibility of pregnancy suggested itself to her. A small, slender woman, always weighing about 75 pounds, she had gained 8 pounds with a concomitant breast and abdominal enlargement. Menarche occurred at 14 years of age. There was a regular twenty-six to twenty-eight day cycle, with a two to three day scanty, painless flow. There had been one normal pregnancy twelve years previously. She was so firmly convinced of her pregnancy that she disregarded the fact that eleven years previously, following a pelvic operation, she had been told that she could never again conceive. She refused to believe the pelvic findings of three physicians, one of them a consultant obstetrician, who informed her that she was not pregnant. Physical examination of this patient also revealed a configuration suggestive of pregnancy. Pelvic examination showed a soft cervix; the uterus was pulled to the right but was normal in size. The adnexa was not palpable. A Friedman test was negative. A twenty-four hour urine specimen collected on the following day showed 35 rat units of gonadotropins and 900 rat units of estrogens. The patient had been told that these tests were completely reliable. On the following day, she menstruated for twenty-four hours. Three weeks later a hormone assay revealed a titre of 35 rat units of gonadotropins and 15 rat units of estrogens. When seen two weeks after this, her abdomen was noticeably flatter and her breasts were smaller. The symptom of morning nausea had cleared up. In the two years since, she has menstruated normally.

Case 3. Mrs. R. N., aged 20 years, white, was sure she was pregnant because of amenorrhea of three months' duration. She had been married seven months. Menarche had occurred at the age of 14. There was a twenty-eight day cycle and a flow of five days' duration. Moderate dysmenorrhea and pre-menstrual breast engorgement were present. Physical examination revealed enlargement of the

breasts with prominent Montgomery tubercles. Pelvic examination showed a soft cervix and the fundus uteri slightly larger than normal. A Friedman test was negative. A hormone assay done three days later showed a urinary excretion of 600 rat units of gonadotropins and 200 rat units of estrogens. The patient was assured that she was not pregnant. She menstruated one week later, and has menstruated regularly in the subsequent eight months.

DISCUSSION

When the initial case was seen, with a negative Friedman test but with striking signs and symptoms of pregnancy, it was decided to carry out

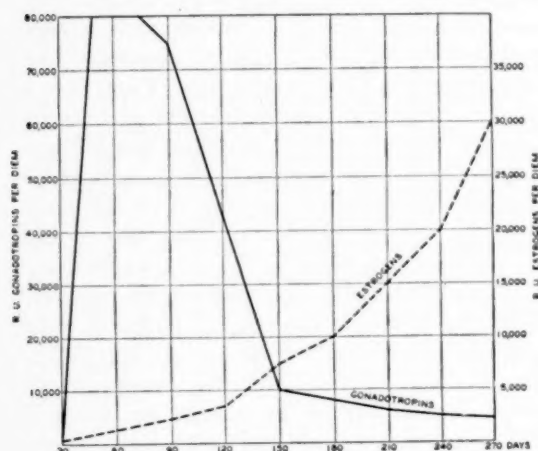


FIG. 1. Mean urinary titers of gonadotropins and estrogens in rat units per diem excreted during normal gestation.

quantitative urinary hormone assays. The decision was based on the fact that in the past, an occasional case of hypopituitarism with advanced pregnancy was observed in which the Friedman test was negative. The subsequent cases were similarly studied to confirm the findings obtained in the first case.

In a previous publication (17), the average values established for urinary gonadotropins and estrogens excreted in twenty-four hours by normally menstruating women were found to range between 40 and 60 rat units, and 60 to 90 rat units, respectively. During pregnancy the levels of both gonadotropins and estrogens rise rapidly as illustrated in figure 1. A positive Friedman test is based on the demonstration of increased amount of luteinizing hormone excreted in the urine. The minimum value for a positive Friedman test is approximately 1 rat unit per c.c. of urine. Assuming a daily urine excretion of 1,500 c.c., a positive

Friedman test implies a minimum daily excretion of 1,500 rat units of chorionic gonadotropic hormone.

In all 3 cases the output of gonadotropins and estrogens was far above normal, but not enough to result in a positive Friedman test. In view of the absence of pregnancy or abnormality of the pituitary or ovary, it appears that this increased hormonal output must be attributed to the influence of the psyche on the endocrine system. Further support of this hypothesis is given by the fact that in each case, when the patient was told that she was definitely not pregnant, prompt recession in physical signs took place, attended by a return to normal hormonal titers. In our patients it was noted that those designated as Cases 1 and 3 were recently married; that Cases 1 and 2 strongly desired a child. Case 2 had been told that she could never again conceive, and yet as soon as a menstrual change developed along with an increase in weight, she felt that she was pregnant. In Case 1, as soon as she developed hypomenorrhea and her configuration changed, the psyche began to exert its influence so as to produce confirmatory evidence of pregnancy, such as breast changes, nausea and vomiting, etc. The relative difference in the enlargement of the breasts and cervix compared to the body of the uterus may be accounted for by differences in tissue response to estrogens. Although the hormone excretion titers were within the ranges seen with an unexpelled dead fetus, the clinical history in no case was compatible with such a condition. In Case 2, a follicular cyst might have been suspected on the basis of the hormone titers alone, but this was offset by the clinical history and negative pelvic examination.

The apparent close relationship between the psyche and the endocrine system offers a more logical explanation for many cases of menstrual disorders and their cure by psychotherapeutic measures. For example, many physicians have seen cases of amenorrhea where the patients feel certain that they are pregnant, and when reassured, immediately begin to menstruate. Similarly, many cases of menorrhagia have been reported due to psychic trauma which responded only to psychotherapy (12, 13). Frank (6), in a recent discussion on endocrine therapy, commented upon many spontaneous cures of amenorrhea of long duration, following medical consultation, with no therapy. Repeated illustrations can be cited of this intimate relationship between the psyche and the glands of internal secretion. The realization of this important factor in functional endocrine disturbances should lead us to evaluate the results of therapy

more critically. However, it does not follow that a policy of therapeutic nihilism should therefore be applied to all endocrinopathies. It is hoped that other cases of pseudocyesis will be similarly studied by other investigators.

We are indebted to Dr. Wm. H. Stoner of The Schering Corporation, Bloomfield, N. J., who supplied the estradiol benzoate (Progynon-B), gonadotropic factor from pregnant mare's serum (Anteron), and gonad-stimulating hormone from pregnancy urine (Pranturon), employed in this investigation.

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TRAINING IN PSYCHOSOMATIC MEDICINE FOR THE MEDICAL RESIDENT

A great many physicians, especially those returning from military service, have expressed a desire for more training in psychosomatic medicine but wish to remain identified with internal medicine. Correspondence with the American Board of Internal Medicine and the Council on Medical Education and Hospitals of the American Medical Association has established that training in psychosomatic medicine will be accepted as a part of the training for certification in internal medicine.

Excerpts from the letters of Dr. Werrell, Assistant Secretary-Treasurer of the American Board of Internal Medicine, and Dr. Arestad, Assistant Secretary of the Council on Medical Education and Hospitals of the American Medical Association, follow:

July 3, 1945, Dr. Werrell: "The Board will recognize a limited amount of training in Psychosomatic Medicine incorporated with the regular residency in internal medicine in approved hospitals, provided this subject is recognized and approved by the Council on Medical Education and Hospitals."

December 27, 1945, Dr. Arestad: "The inclusion of this subject in the residency program in medicine is, I am sure, an effective means of broadening the resident's experience in this related field which occupies a large part of general medical practice."

We believe that such training will be a fundamental step in the development of psychosomatic medicine by producing a group who would be capable of cooperation in teaching and research between the fields of medicine and psychiatry. It is hoped that approved hospitals, especially those connected with medical schools, will avail themselves of this opportunity to provide psychosomatic training for their medical residents.

EDWARD WEISS, M. D.

A COMPARISON OF THE EXERCISE RESPONSE IN ANXIETY STATES AND NORMAL CONTROLS

MAXWELL JONES * AND VERONICA MELLERSH

WITH THE TECHNICAL ASSISTANCE OF MONICA MUSGRAVE *

INTRODUCTION

Since the end of 1939, 2324 cases of effort syndrome (E. S.) have been treated at the Effort Syndrome Unit of this neurosis centre (8, 12, 7, 13, 14, 15, 11, 17, 2). We have always believed effort syndrome to be a neurosis and that the problem is one for the psychiatrist rather than the cardiologist. Paul Wood (21), a cardiologist, while working at this hospital, came to the following conclusion:

"It is urged that the diagnosis of 'Effort Syndrome' be dropped. A proper psychiatric diagnosis is nearly always available; if attention is called to the presence of effort intolerance, let effort intolerance be added in brackets."

We have retained the diagnosis E. S. simply for research purposes.

In wartime, individuals in the Forces are subjected to greater physical stress than is usual in civilian life, and poor exercise response becomes relatively more important and merits careful study. As the war progressed there was a distinct tendency by British psychiatrists to drop the use of the term effort syndrome, and cases which would previously have arrived here with such a diagnosis arrived as anxiety states, mild depressions, etc. In 1941 the number of admissions with a diagnosis of E. S. made by army and civilian psychiatrists before arrival here was 650; in 1944 the figure had dropped to 91. There is no reason to assume that the condition has become less common—it is simply that the diagnosis E. S. is out of favour; psychiatrists in this country prefer to classify patients according to their psychiatric disability rather than their effort intolerance, and with this trend we entirely agree.

Many E. S. patients are clinically indistinguishable from anxiety states, except that they describe in addition to the usual somatic anxiety symptoms an excessive bodily response to exercise; however, many, although describing vegetative symptoms on excitement or exertion, show surprisingly little

real anxiety and usually give a history of lifelong symptoms: these two groups are discussed in the next paper. If the effort intolerance is purely subjective and no real disability can be demonstrated by objective tests, then the condition is more accurately thought of as an effort phobia. If, on the other hand, a real disability can be demonstrated, particularly if the same disability is absent in the anxiety states without a history of effort intolerance, then there would appear to be good reason for keeping the E. S. group apart from the main body of anxiety states.

MATERIAL

For our studies we have used a random sample of 20 healthy men from a nearby barracks. They were all tradesmen (fitters) and in good health at the time of testing. None had a past history of serious illness affecting the respiratory or circulatory systems. Each had a short interview with the psychiatrist and none showed any evidence of frank neurosis. Their weights ranged from 120 to 154 lbs. with a mean of 143.4 lbs. Their ages ranged from 18 to 35 with a mean of 24.7.

Ten patients with a characteristic history of E. S. and 10 patients with anxiety states and somatic anxiety symptoms but no complaint of poor exercise response were chosen. Six of the E. S. patients described effort intolerance and symptoms of excessive vegetative lability on excitement since childhood. In the remaining 4 E. S. patients their symptoms dated from recent years—during army service. All 20 patients were free from any demonstrable organic disease and had no history of serious respiratory or circulatory illness at any time in their lives. The E. S. patients' weights ranged from 132 to 164 lbs. with a mean of 143.6 lbs., and their ages ranged from 24 to 36 with a mean of 29. The comparable figures for the anxiety states were 133 to 161 lbs. with a mean of 143.9 lbs., and 23 to 36 with a mean of 30 years.

The controls, being craftsmen, were leading relatively sedentary lives and had less physical training, marching, etc., than the patients.

* From Mill Hill Emergency Hospital, London, England.

METHOD

Oxygen Consumption and Blood Lactate After Exercise

A bicycle ergometer was employed and we have used a standard exercise throughout: pedalling at 42 revolutions per minute, the friction of the brake band being equivalent to a weight of 9 lbs., and the subject doing 6,750 foot pounds of work per minute for five minutes. In deciding on the amount of work to be done for the standard exercise we chose the heaviest work which could be done satisfactorily by the worst of the E. S. material. There were two reasons for this: 1) the greater the work done (the time factor remaining constant) the larger the O_2 debt and therefore the higher the lactate rise; 2) with only small lactate rises any clinical differentiation would be difficult or impossible (18). It has been shown (22) that O_2 consumption may be the same in controls and cardiac patients exercising at light and moderate loads. It is only when the work load is increased to the point where the subject has reached his maximal O_2 intake that any discrepancy between the control and the cardiac patient can be adequately demonstrated (1).

The choice of method for measuring the metabolic increase brought about by exercise presents very great difficulties. Knipping (16) believes that the most satisfactory technique is to use a spirometer to which O_2 is added at the rate sufficient to keep the level of the spirometer constant. The rate of O_2 inflow into the closed circuit then equals the O_2 consumption. He increases the work load progressively until the maximum rate of O_2 intake is reached: this value is reached after two or three minutes and the work is interrupted after another two or three minutes. We experimented with this technique but were unable to have a satisfactory apparatus built in wartime, and in any case when using an improvised machine found that it was unsatisfactory to have neurotic patients breathing into a closed circuit during exercise.

Ideally, one would like to compare the efficiency of muscular work in the three groups we have studied. Simonson and Enzer (19) in their excellent review of the physiology of muscular exercise and fatigue in disease discuss the whole problem adequately. The "coefficient of efficiency" $\frac{W}{E_w - R}$

(W =amount of work done; E_w =the total energy expenditure; R =the energy expenditure during rest) may be determined by two methods: (A) to measure the excess energy expenditure from the

beginning of the work until the end of recovery and to relate it to the total amount of work done; (B) to let the subject exercise till a steady state is reached (after three to five minutes of exercise, when the body "pays as it goes" and no further oxygen debt is incurred, *i.e.*, anaerobic and aerobic processes are balanced), and then to measure the excess oxygen uptake per minute during this state and relate it to the amount of work done per minute. However, neither of these methods was suitable for our purpose; first, because to keep a mouth piece and nose clip in position continuously during the five minutes standard exercise and for a further ten to twenty minutes post exercise would be impracticable with neurotic subjects; second, because the standard exercise used was too heavy to allow a steady state to develop in most of the patients. Finally, the possibility of measuring the entire oxygen debt was given up mainly because of the difficulty in deciding when the oxygen uptake had fallen to the resting metabolic rate. We have measured the O_2 uptake for only five minutes post exercise, by which time, of course, the oxygen debt had not been fully repaid; however, the oxygen consumption decreases abruptly during the beginning of recovery and by far the major portion of the decrease has occurred within the first five minutes post exercise, only a negligible decrease occurring during the next five minutes. This is illustrated by the following mean figures of O_2 uptake per minute obtained for 3 E. S. patients doing standard work: resting 288 c.c., two to three minutes from start of exercise 1529 c.c.; four to five minutes from start of exercise 1824 c.c.; one to two minutes post exercise 1439 c.c.; four to five minutes post exercise 431 c.c.; nine to ten minutes post exercise 399 c.c. We fully realize that taking only this five minutes post exercise period is open to criticism but believe that by attempting a more exact (and exacting) technique with neurotics we would have defeated our own purpose by increasing the risk of provoking emotional reactions.

For the actual test the patient was rested for half an hour before cycling, and a sample of venous blood was removed for lactate determination. The subject then cycled for five minutes as above, and fifteen seconds before the completion of exercise the mouthpiece of the Douglas Bag was inserted and a nose clip applied. At the completion of the five minutes cycling, the tap leading into the Douglas Bag was opened and the expired air collected for the five minutes immediately post exercise. Two Douglas Bags connected by a three-way tap were used and expired air collected in one bag for the

first ninety seconds and collected in the other bag for the remaining three and one-half minutes expirations. During this five minutes post exercise period, the respirations per minute were counted. Finally, a second venous blood sample was removed ten minutes after the completion of exercise for lactate determination. The whole procedure was carried out in detail for four consecutive days prior to testing in order to familiarize the subject with the method.

The Douglas Bags were well shaken to ensure mixing of the expired air and a sample from each bag was withdrawn through a Brodie Gas Sampler. Duplicate samples from each gas sampler were analyzed in a Haldane Gas Analyzer. These duplicate determinatives agreed within 0.04% for O₂

used in the aeration procedure was N/10 KMNO₄. Acceptable determinations had blanks of not more than 0.1 c. c. of 0.002N I₂ and the duplicates agreed, within 0.05 c. c. of 0.002N I₂.

In testing the E. S. patients and the anxiety states, the complete test was repeated on three successive occasions to establish the reliability of the method. The intercorrelation of the three means for the lactate rise gave a reliability $\gamma=0.96$ and for the O₂ consumption, $\gamma=0.75$. These figures indicated that the reliability of repeated testing of the same subject with both lactate and O₂ assays was sufficiently good to justify only one test being performed. This meant a great economy of time and for the 20 controls only one measurement of lactate and O₂ uptake was made.

TABLE I

COEFFICIENT OF CORRELATION FOR PULSE RESPONSE (TREATED IN VARIOUS WAYS) TO STANDARD WORK PERFORMED ON 2 SUCCESSIVE DAYS

	20 normal controls		20 E. S. + anxiety states	
	Correlation coefficient	Standard error	Correlation coefficient	Standard error
1. Resting pulse	0.605	.142	0.813	.076
2. First minute post exercise	0.512	.165	0.724	.103
3. Second minute post exercise	0.536	.159	0.691	.117
4. Third minute post exercise	0.514	.165	0.692	.117
5. Resting pulse minus first minute post exercise	0.382	.191	0.564	.153
6. 1, 2, 3, 4, 9 minutes minus resting pulse $\times 5$	0.665	.125	0.512	.165
7. 1, 2, 3, 4, 9 minutes minus resting pulse	0.581	.148	0.550	.156
8. 1, 9 minutes minus resting pulse $\times 2$	0.512	.165	0.462	.175
9. 1, 2, 3, 4, 9 minutes post exercise	0.562	.153	0.667	.124

and 0.03% for CO₂. Frequent analyses were made on atmospheric air, checking 20.94 for the combined CO₂ and O₂ determinations within 0.03%. The mercury levelling bulb on the Haldane had an automatic lowering and raising device run by a small motor.

The blood samples were analyzed for lactate content; the ten minute sample representing the time when the lactate was probably at its peak. There is a lag in the disappearance of lactate after exercise, which in the trained subject may last for six to eight minutes but in the untrained or non-athletic subject may last two or three times as long (18). The blood samples were drawn into tubes containing a small amount of mixture of potassium oxalate and sodium fluoride ground up together in the proportion of 1:10. The latter was to prevent the lactic acid from decomposing. Determinations were made in duplicate following Friedmann's method (6). The treatment of the filtrates with CuSO₄ and Ca(OH)₂ was omitted as suggested for normal human blood (6, 4). The oxidizing agent

Pulse Response to Exercise

The same standard work on the bicycle ergometer was used. The subjects did the test on three successive days before any recorded test was made. Many attempts have been made to devise a reliable test of physical efficiency from the pulse response after exercise. This method, however, can never be very accurate as cardiac rate is only one factor which determines cardiac output, the latter being what one would really like to measure. However, after moderate or severe physical exercise, a characteristic curve is obtained in which the major decrement occurs within the first four minutes, and then flattens out rapidly.

Our procedure has been to count the pulse rate for a full minute for the ten successive minutes immediately following the cessation of exercise. The test was always repeated on successive days. Much trouble was taken to ensure standard conditions, and if necessary the subject rested more than thirty minutes before starting exercise if there

was any difficulty in obtaining a constant resting pulse rate. Table I shows the retest reliability (rank correlation) of various ways of expressing the pulse response to standard work on successive days. The E. S. patients and anxiety states are taken together as one group of 20. It will be seen that the resting pulse and peak pulse (for the minute immediately after the cessation of exercise) correlate better in the E. S. plus anxiety groups (resting $\rho=0.813 \pm .076$ SE; peak $\rho=0.724 \pm .103$ SE) than in the controls (resting $\rho=0.605 \pm .142$ SE; peak $\rho=0.512 \pm .165$ SE).

Of the various ways of expressing the pulse figures shown in Table I no one method gives an outstandingly high correlation in both controls and E. S. plus anxiety states. We have paid more attention to the pulse area than the other methods available because it takes more account of the physiological changes occurring throughout the recovery period. It is obtained by adding the pulse figure for the first four minutes after the cessation of exercise and the mean of the last three minutes counted (eight, nine and ten minutes) and subtracting five times the resting pulse. We have used it for some years now and believe it to be the most accurate method of expressing the pulse response to moderate exercise: its correlation with other methods of quantitating exercise response (oxygen uptake and lactate rise) will be discussed later.

RESULTS

Oxygen Uptake After Exercise

Figure 1 shows the O_2 uptake after exercise for the three groups—normal controls, E. S. patients and anxiety states. The volumes represent the mean O_2 uptake per minute for the five minutes post exercise during which the expired air was collected in the Douglas Bags. Obviously the O_2 uptake during these five minutes is rapidly falling as the O_2 debt is repaid, but for comparative purposes the mean O_2 uptake per minute is the most convenient to use. Table II gives the same results in more detail. The volumes given for the normal controls are obtained from a single test, those from the patients are the mean of three tests done on successive days.

The mean O_2 uptake per minute for the 20 controls is $586 \text{ c. c.} \pm 35.9 \text{ s. d.}$ (range 533 to 638). The mean of the 10 E. S. patients is $729 \pm 109.0 \text{ s. d.}$ (range 581 to 923), and for the anxiety states $702 \pm 126.0 \text{ s. d.}$ (range 470 to 901). When the E. S. patients and anxiety states are added together,

the mean O_2 uptake is $716 \pm 118.2 \text{ s. d.}$ (range 470 to 923).

The difference between both groups of patients and the normal controls is highly significant (Table III). The critical ratio (c. r.) is 3.83 ($P < .01$) for the difference between controls and E. S. patients, 2.53 ($P < .05$) for the difference between anxiety states and controls, and 4.58 ($P < .01$) for the difference between E. S. patients plus anxiety states and controls.

Blood Lactate Rise After Exercise

Table IV gives the blood lactate rise after exercise in the three groups—controls, anxiety states and

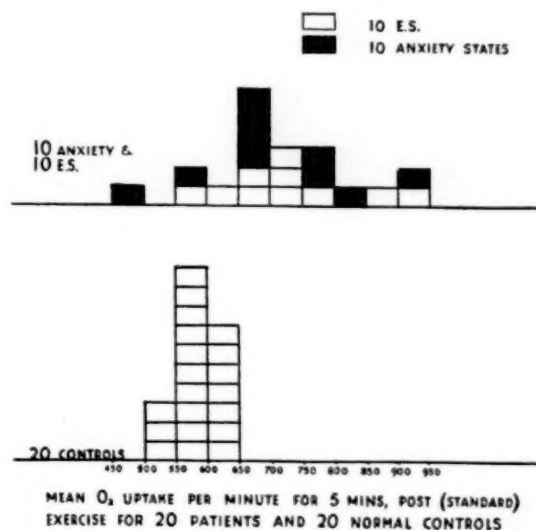


FIG. 1

E. S. patients. The 20 controls gave a mean lactate rise of $11.1 \text{ mgm. \%} \pm 6.3 \text{ s. d.}$, the 10 E. S. patients a mean lactate rise of $21.4 \text{ mgm. \%} \pm 8.6 \text{ s. d.}$, the 10 anxiety states a mean lactate rise of $15.9 \text{ mgm. \%} \pm 7.8 \text{ s. d.}$, and the 10 E. S. patients plus 10 anxiety states a mean lactate rise of $18.6 \text{ mgm. \%} \pm 8.4 \text{ s. d.}$

The difference between the controls and the E. S. patients (c. r. 3.12; $P < .01$) and the controls and E. S. patients plus anxiety states (c. r. 3.32; $P < .01$) is highly significant, but the comparison between the controls and the anxiety states is less conclusive (c. r. 1.64 $P < .1$) (Table III). Of the 10 E. S. patients, 6 had a lactate rise greater than the highest control rise (22 mgm.%) while only one of the anxiety states showed a rise above this figure.

Pulse Response to Exercise

Figure 2 shows graphically the pulse response of the various groups to standard work. All figures

represent the mean of two tests done on successive days. For the 20 normal controls, the mean resting pulse was 67, and the mean pulse figures for the first four minutes after standard work were 100, 82, 81, 79. The means of the eighth, ninth and tenth after exercise were added together and averaged, the figure obtained being 76.

The corresponding figures obtained for the 10 E. S. patients were 73, 121, 106, 100, 95, and 85,

compared with the controls are maintained and result in a much slower decrement.

The "Pulse Area" (see Method) is probably the best method for quantitating the pulse figures after standard work. It is obtained by adding the five pulse figures—the first four minutes after exercise and the mean of the eighth, ninth and tenth minutes, and subtracting five times the resting pulse.

TABLE II

O₂ UPTAKE IN CUBIC CENTIMETRES PER MINUTE AFTER STANDARD WORK

	Range	Mean	S. D.
20 normal controls.....	533 to 638	586	35.9
10 E. S. patients.....	581 to 923	729	109.0
10 anxiety states.....	470 to 901	702	126.0
10 E. S. + 10 anxiety states.....	470 to 923	716	118.2

TABLE III

SIGNIFICANCE OF DIFFERENCE BETWEEN MEANS (C. R.) OBTAINED BY COMPARING GROUPS OF 20 CONTROLS, 10 E. S. PATIENTS AND 10 ANXIETY STATES, WITH RESPECT TO O₂ UPTAKE, LACTATE RISE AND PULSE AREA AFTER STANDARD WORK

	O ₂ uptake	Lactate	Pulse Area
Controls and E. S.....	3.83	3.12	4.4
Controls and anxiety states.....	2.53	1.64	2.08
Controls and E. S. plus anxiety states.....	4.58	3.32	3.95
E. S. and anxiety states.....	0.47	1.82	1.28

TABLE IV

BLOOD LACTATE RISE ABOVE THE RESTING LEVEL FOLLOWING STANDARD WORK. EXPRESSED IN MILLIGRAMMES PER CENT

	Range	Mean	S. D.
20 normal controls.....	3 to 22	11.1	6.3
10 E. S. patients.....	8 to 35	21.4	8.6
10 anxiety states.....	0 to 27	15.9	7.8
10 E. S. and 10 anxiety states.....	0 to 35	18.6	8.4

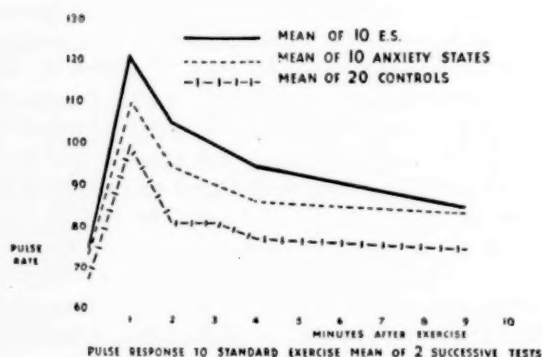


FIG. 2

and for the 10 anxiety states, 72, 110, 97, 91, 88, and 84. Figure 2 shows how, when the results are plotted, the curves of the three groups are almost parallel. The greater pulse rise immediately after exercise in the E. S. patients and anxiety states

Table III shows that the difference between the controls and E. S. patients for the mean pulse area is highly significant (c. r. 4.4; $P < .01$). The mean pulse area for the controls is 85.35 ± 36.0 s. d. while that for the 10 E. S. patients is 150.7 ± 36.73 s. d. The difference between controls and the 10 anxiety states is less marked (c. r. 2.08; $P < .05$). The mean pulse area for the anxiety states was 116.45 ± 34.7 s. d. Comparing the controls with the 10 E. S. patients plus the 10 anxiety states, a highly significant difference is again obtained (c. r. 3.95; $P < .01$), the mean pulse area for the 20 patients being 135 ± 40.69 s. d.

INTERCORRELATION OF THE THREE TESTS—O₂ UPTAKE, LACTATE RISE AND PULSE AREA AFTER STANDARD WORK

Table V shows the intercorrelations of the three tests for the two groups separately. While the

intercorrelations appear to be rather higher in the case of the E. S. and anxiety group, none of the differences between the two groups are significant. Taken together, these results show that the three tests used tend to measure the same function.

This conclusion is reinforced by study of the intercorrelations of the three tests taken on a total of 50 subjects, the two groups studied above and 10 conversion hysterics of similar age and weight. The product moment correlations between the tests are as follows:

O₂ consumption pulse area..... $\gamma = 0.627 \pm 0.087$ S.E.
Pulse area lactate..... $\gamma = 0.558 \pm 0.098$ S.E.
O₂ consumption lactate..... $\gamma = 0.494 \pm 0.108$ S.E.

In view of the fact that the three tests are thus shown to measure a common function, it is justifi-

17.0 L, 30.5 L and 26.0 L respectively. As the mean oxygen uptake per minute for the three groups was 586 c. c., 729 c. c. and 702 c. c. respectively, the post exercise oxygen equivalent (*i. e.* the ventilation required for the assimilation of 100 c. c. of oxygen) was 2.9 for the controls, 4.2 for the E. S. patients and 3.7. for the anxiety states. The oxygen uptake per breath was 34.1 c. c., 26.0 c. c. and 31.6 c. c. respectively for the three groups, and the volume per breath 929 c. c., 996 c. c. and 974 c. c. respectively in the controls, E. S. patients and anxiety states.

DISCUSSION

From the results obtained it is clear that a significant differentiation between the exercise response of normal controls and E. S. patients can be made

TABLE V
COEFFICIENT OF CORRELATION (RANK METHOD) FOR THE 3 METHODS OF MEASURING THE RESPONSE TO STANDARD WORK—O₂ UPTAKE, LACTATE RISE AND PULSE AREA

	20 normal controls		20 E. S. + anxiety states	
	Correlation coefficient	Standard error	Correlation coefficient	Standard error
O ₂ uptake/lactate rise.....	0.563	0.157	0.271	0.212
O ₂ uptake/mean of 2 pulse areas.....	0.224	0.218	0.553	0.159
Lactate rise/mean of 2 pulse areas.....	0.235	0.217	0.574	0.154

TABLE VI
VENTILATION RESPONSES FOR THE 5 MINUTES IMMEDIATELY FOLLOWING STANDARD WORK. BY OXYGEN EQUIVALENT IS MEANT THE AMOUNT OF VENTILATION REQUIRED FOR THE ASSIMILATION OF 100 C.C. OF OXYGEN

	Breaths per minute	Litres per minute	O ₂ uptake per minute	Oxygen equivalent	O ₂ uptake per breath	Volume per breath
20 controls.....	18.3	17.0	586	2.901	34.1	929
10 E. S. patients.....	30.6	30.5	729	4.184	26.0	996
10 anxiety states.....	26.7	26.0	702	3.704	31.6	974
E. S. plus anxiety states.....	28.7	28.3	716	3.944	28.8	985

able to combine them. When the results of the three tests are converted into standard scores and combined into a single score, the C. R. of the difference between the controls and the anxiety states plus E. S. is 5.2. The probability that this difference has occurred by chance is less than one in a million.

VENTILATION

Table VI shows the essential factors regarding the post exercise ventilation in the patients and controls. It will be seen that for the five minutes post exercise, the mean respiratory rate per minute was 18.3 for the controls, 30.6 for the E. S. patients and 26.7 for the anxiety states. The mean ventilation in litres per minute for the three groups was

in the three tests—O₂ Uptake, Lactate Rise and Pulse Area. The difference between the controls and anxiety states on the same three tests is significant except in the case of the lactate rise—C. R. 1.64 ($P < .1$). Taking the E. S. and anxiety states together, the exercise response is significantly different on all three tests when compared with the controls (Table III). By combining all three tests (which have been shown statistically to measure a common function) and comparing the 20 controls with the 20 patients (E. S. plus anxiety states), a highly significant differentiation is obtained. In other words, there would appear to be almost equal justification for talking about poor exercise response in the anxiety states as in E. S. patients. In the one group the patient is conscious of this poor exercise response and tends to associate his symptoms with

physical effort (in fact, develops an effort phobia); in the other group no such awareness is present and the somatic anxiety symptoms are not correlated with exercise. This conforms to the clinical impression that most E. S. patients are indistinguishable from anxiety states, except for the fact that they do have an effort phobia. (While it is fully realized that E. S. follows many infective illnesses and may be found in conjunction with almost any physical, "nervous" or mental illness, we are concerned here with cases of E. S. where the somatic symptoms on exertion occur for no apparent reason, except perhaps anxiety.)

Comparing controls with patients, the lactate determinations appear to be less discriminative than O_2 figures and consistently lower critical ratios are obtained (Table III). This difference might not have been obtained if heavier work had been done. Margaria, Edwards and Dill (18) found that in the trained runner no lactate appears in the blood up to a rate of work corresponding to about two-thirds of the maximal metabolic rate, after which the lactate increases rapidly. Dill, Talbott and Edwards (3) studied lactate rise with the subject running on a treadmill at 9.3 km. per hour for twenty minutes. This caused a rise in metabolism of eight to twelve times the resting rate. They concluded that this type of experiment furnished an excellent guide to the capacity of the subject for great and sustained physical activity. The standard exercise we have used increased the metabolic rate approximately seven times in the normal controls. However, in lighter grades of work the lactate rise may still furnish a useful index of the efficiency of the individual's response to physical work, provided the work is sufficiently strenuous to incur an oxygen debt; when such a debt is incurred lactate appears in the blood and its concentration gives some indication of the size of the oxygen debt.

Considering now the ventilation in the controls and two groups of patients, there is certainly no evidence of deficient ventilation. There appears to be some confusion in the literature on this point. Haldane and his collaborators (9) appear to have been the first workers to suggest that the rapid shallow breathing of the E. S. patient at rest contributed to a state of anoxemia. Hick, Christian and Smith (10), studying E. S. patients, found faulty oxygenation of the blood passing through the lungs (oxygen saturation at rest in many instances was below 90%), and suggested that this might be caused by shallow breathing, and if the chest was held in the expanded position then the increased residual air and a normal tidal air might result

in an inadequate ventilation. We found (14) that at rest the E. S. patient breathes approximately twice as fast and half as deeply as the normal control; when, however, the E. S. patient is exercised, this state of affairs is entirely altered and the volume per breath post exercise is actually greater than that of the normal control (Table VI). The respiratory rate, however, remains approximately twice that of the normal controls. In previous work (13) we failed to find any evidence of abnormal anoxemia in the arterial blood of E. S. patients after strenuous exercise. Some indication of the efficiency of the ventilation is obtained by measuring the amount of ventilation, expressed as litres of air, necessary in order to assimilate 100 c. c. of oxygen by the subject. Thomas (20), studying oxygen equivalent, found it to be 2.5 in the normal subject; after exercise he found an increased ability to assimilate oxygen so that the oxygen equivalent dropped. In E. S. he found an oxygen equivalent of 4.5 after exercise. Using this measure we found the oxygen equivalent post exercise was 2.9 for the controls, and 4.2 for the E. S. patients. This shows clearly the much greater ventilation per minute used by the E. S. patients in order to assimilate the same amount of oxygen as the controls. Assuming that conditions for the interchange of gases in the lungs are similar in both controls and E. S. patients, then the E. S. patients ventilate excessively in order to meet the optimal conditions for oxygen assimilation. Previous work on E. S. patients (13) showed that after maximal work no evidence of hyperventilation alkalosis was obtained, the blood pH was never found to become more alkaline than the resting value, and the carbon dioxide pressure fell by only 3 to 4 mm. Hg. Moreover, in the same study, the oxygen saturation of arterial blood at rest in 10 E. S. patients was shown to range from 97% to 92% (mean 95.6%). After maximal work the oxygen saturation was found to be below 90% in only one case. That at most only a small drop in O_2 saturation occurred post exercise is not surprising in view of the fact that the E. S. patients tested were free from any physical signs of pulmonary disease and had no history of previous pulmonary trouble. Low arterial O_2 saturation is common in certain forms of pulmonary disease at rest, but may not occur even after exercise in uncomplicated cardiac disease (5). Thus from the evidence furnished by our results we must conclude that the E. S. patient immediately post exercise *does* hyperventilate but this results in no demonstrable alkalosis and there is adequate oxygenation of the arterial blood.

Of the three tests used the O_2 uptake is probably the most reliable measure of physical response to exercise; the pulse rate indicates only one aspect of the circulation's response to exercise and is readily influenced by emotional factors; the lactate rise is secondary to the formation of an O_2 debt and would probably be a more accurate index of physical distress in maximal physical work than as a measure of physical response to moderate work, such as the standard exercise used for the present series of tests. The O_2 uptake reflects the response of the body as a whole to exercise and gives one a much clearer idea of what is actually being measured.

SUMMARY

1. Twenty normal controls, 10 anxiety states (with somatic anxiety symptoms but with no complaint of poor exercise response) and 10 effort syndrome patients are compared regarding their responses to moderate exercise on a bicycle ergometer.

2. O_2 uptake, lactate rise and pulse area were determined after exercise for each group.

3. The anxiety states as well as the effort syndromes had a significantly poor exercise response compared with the normal controls.

4. O_2 consumption after standard work is probably the most satisfactory quantitation of exercise response, but the three tests collectively give the most reliable index.

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PSYCHOSOMATIC FELLOWSHIPS

Cornell announces a project in internal medicine at the New York Hospital, designed to deal clinically and experimentally with psychosomatics. There are three main objectives—1) To develop a practical method of dealing with ambulatory clinic patients who suffer from symptoms related to their emotional states and life situations; 2) To engage in experimental study of the mechanisms involved in illness of this nature; and 3) To train especially able young physicians in experimental methods and a critical psychosomatic approach to the care of the sick. Approximately half time will be spent in the diagnosis and management of patients and half time in research dealing mainly with mechanisms underlying symptoms.

The project will be directed by Dr. Harold G. Wolff with the assistance of an internist, Dr. Stewart Wolf; a psychiatrist, Dr. Herbert S. Ripley, Jr.; and six fellows. Fellows will be appointed for a period of one year with the expectation of serving for two or more. Their salary for the first year will be \$2500. Candidates for fellowship should have had at least two years training in internal medicine and have given evidence of a psychiatrist orientation. They need not necessarily have had experience in research but must have a serious interest in investigation, energy and curiosity.

Prospective candidates should arrange for a personal interview through Dr. David P. Barr, Professor of Medicine, The New York Hospital, 525 East 68th Street, New York 21, New York.

THE EFFECT OF EXERCISE ON SOLDIERS WITH NEURO-CIRCULATORY ASTHENIA

MAXWELL JONES AND R. SCARISBRICK

WITH THE TECHNICAL ASSISTANCE OF MONICA MUSGRAVE

INTRODUCTION

The term *effort syndrome*, as used here, refers to a relatively excessive response to effort as manifested by breathlessness, palpitation and subjective feeling of fatigue on even mild exercise, along with excessive vegetative lability on emotional excitement, e.g., sweating, palpitation, giddiness, etc., as described by the patient or objectively observed. If there be a known organic cause, then that diagnosis is, of course, used in preference to the term effort syndrome (E.S.). "Syndrome" is a descriptive term generally used to avoid premature aetiological conception; there is apparently no common aetiology to E.S.; and as a descriptive term is generally favoured, the American preference for the term "neurocirculatory asthenia" seems reasonable.

The classification of psychiatric disorders is far from satisfactory and this leads to much confusion; descriptive or aetiological classification is frequently used indiscriminately. The position is made even more difficult in wartime by the fact that war neuroses tend to fit less satisfactorily into existing classifications than do the neuroses commonly seen in peacetime. The same difficulty of classification occurs with all organ neuroses. It would appear that the real difficulty in applying existing psychiatric classifications to E.S. patients, or to organ neurosis, or indeed to much of the neurotic material seen in wartime, is that one is dealing with an "embryonic" neurosis, the breakdown occurring readily as a result of comparatively mild stress because of marked predisposition; this predisposition probably results from constitutional and personality factors.

In the majority of E.S. patients seen here, constitutional (including personality) factors would appear to be more important than psychogenic factors; thus when a breakdown occurs there may be no pronounced affective disorder, and no adequate psychopathology to explain the illness. From this it follows that existing psychiatric classifications, based on aetiological or descriptive grounds, would be difficult to apply. It therefore seems reasonable to use a classification which takes into account constitution and personality more fully than do existing classifications. One can divide the E.S.

material into three broad groups: 1) Where the poor physical endowment is the primary factor in producing symptoms. Here we are simply dealing with a poor machine, which shows excessive response to physical effort. Here the patient has effort intolerance which has been present since earliest recollection. 2) As above, but the patient responds in a neurotic manner to his constitutional inferiority. In this sense there is a psychological aetiology, but the constitutional factor is the basic one. The emotional reaction may take any form, depending on the personality, and may simply amount to displeasure. Here the patient *feels* he has an effort intolerance, but his disability may actually be less than he believes it to be. Such patients usually give a history of effort intolerance since childhood but the mere disability of Group 1 frequently changes under stress to the neurotic attitude of Group 2. 3) Primarily neurotic. Here the usual aetiological factors determining a neurosis will apply. The form may be determined by the constitutional physical inferiority which, if present, colors the whole picture, but is of only secondary importance; or it may be wholly psychogenically determined. Such "illness" tends in our experience to be of comparatively recent origin and is particularly prone to result from the emotional and physical stresses of wartime.

By *neurosis* is meant an upset of the normal harmonious functioning of the mind and body resulting from some personal inadequacy to meet a psychological situation or problem. Poor general health, weak physical constitution, low intelligence, etc., may predispose to such a neurosis, but these are in themselves not enough; the individual has failed to meet the demand of his environment or of his conscience and a conflict has been set up. Thus, the Group 1 E.S. has the symptomatology of the other two groups but his physical limitation has been satisfactorily met and presents no handicap, so he has no neurosis. The opposite is true of Group 2 E.S.

Such a division into three groups has been in use here for the past two years and has been found more convenient and useful than our earlier classification (2). Unfortunately only an occasional Group 1 E.S. has been seen (from the definition it is clear that they would only be discovered when

examining a large random sample of controls because they do not regard themselves as ill and therefore would not report sick), and no detailed study of this group has been possible.

MATERIAL

The subjects studied consisted of 35 E.S. patients and 35 controls. The patients were an unselected group showing the characteristic features of E.S. Their ages ranged from 19 to 36 with a mean of 28; their weights varied from 117 lbs. to 184 lbs. with a mean of 141 lbs.; none of them was obese, and they all tended to have the spare, asthenic physique of the typical E.S. patient. After much deliberation, it was decided to make no correction for weight, and all the subjects tested did exactly the same amount of work. This difficulty was largely obviated in the group of patients by the fact that there was a small range of weights; all but 7 of the patients were between 120 and 150 pounds in weight, the weights of these 7 being 117, 151, 155, 159, 164, and 184 lbs.

Twenty-five of the patients belonged to Group 2 E. S. and had a life-long history of poor exercise response, to which disability they had responded in a neurotic manner, *i.e.*, many had a well-marked invalid outlook and had arranged their lives accordingly; they avoided heavy physical work whenever possible and deliberately chose sedentary occupations which would make minimal demands on them physically. There was no clinical evidence of organic disease but the majority firmly believed they had "weak hearts," "lung trouble," etc.

Ten of the patients belonged to Group 3 E.S. and had no definite evidence of neurotic predisposition before the onset of their "illness" which appeared to result from understandable emotional difficulties.

The 35 controls consisted of 20 soldiers from a nearby barracks, and 15 others of whom 8 were physical training instructors. The other 7 were members of the hospital staff, including 3 doctors. The soldiers from the barracks were a random sample, and were craftsmen or clerks, not having any routine physical exercise.

The ages of the control group as a whole ranged from 18 to 47, with a mean of 32; their weights varied from 128 lbs. to 182 lbs., with a mean of 151 lbs. Apart from the 8 P. T. instructors, none of the group was in a trained physical state, and of the P. T. instructors 2 were over 40 years of age.

METHOD

Standard Work

A bicycle ergometer was used. The subject pedalled for five minutes at 42 revs. per minute against a frictional resistance equivalent to 6,750 foot lbs. per minute. The whole procedure, including the venipunctures for lactate determinations and technique for lactate assays, was similar to that described in the previous paper. Pulse rate also was recorded as described in the previous paper. Pulse Area was again used to indicate the form of the pulse decrement following standard exercise; it was obtained by adding the pulse figures for the first four minutes post exercise plus the mean of the eighth, ninth and tenth minutes and subtracting five times the resting rate.

Maximal Work

The procedure here was similar to that adopted for the standard work experiments except that the subject was now asked to work to complete exhaustion, and an attempt was made to achieve this within ten minutes by choosing a suitable weight to start with, and if necessary adding further weights while the patient was actually pedalling. In view of the fact that no standard weight was used, no accurate comparison of the amount of work done by the various subjects was possible. Actually, the E.S. patients, in the large majority of cases, reached their end point within the ten minute period when doing work equivalent to 6,750 foot lbs. per minute; *i.e.*, the same work level as was used for the standard work. The controls invariably needed considerably more weight on the friction band.

It is fully realised that the "end point" must be an arbitrary one, dependent at least as much on psychological factors as on the physiological changes occurring as a result of physical work. All that can be said is that the conditions were standardized and every encouragement given to the subject to produce his best performance.

As in the standard work, a blood sample for lactate estimation was removed at rest, and ten minutes after the cessation of exercise.

The pulse was taken at rest, and then continuously for ten minutes after exercise. Twenty controls, in this instance entirely restricted to the random sample of clerks and craftsmen from the local barracks, were studied, along with a similar number of E.S. patients. All these men had also been included in the standard work group.

RESULTS

Blood Lactate Rise After Standard Work

In the 35 controls the mean lactate rise was 21.1 mgm.% \pm 11.79 s. d. (the mean resting value was 11.0 mgm.% \pm 2.69 s. d. and the mean maximal figure was 32.1 mgm.% \pm 11.88 s. d.).

The 35 E.S. patients gave a mean rise of lactate from the resting level of 26.99 mgm.% \pm 12.12 s. d. (mean resting level 12.7 mgm.% \pm 3.57 s. d. and mean maximal figure 39.69 mgm.% \pm 13.45 s. d.).

The difference between the two means is significant; critical ratio, 2.03 ($P < .05$). When the two groups of E.S. are studied separately, striking differences become evident (Table I).

The 10 patients in Group 3 E.S. show a mean lactate rise of 19.8 mgm.% \pm 10.49 s. d., which is actually less than that found in the control group (21.1 mgm.%).

The 25 patients in Group 2 gave a mean lactate rise of 29.6 mgm.% \pm 12.3 s. d. with a mean resting level of 13.5 mgm.% \pm 3.92 s. d. and a mean maximal lactate of 43.12 mgm.% \pm 13.03 s. d. When compared with the mean of the controls' lactate rise the difference is significant; critical ratio = 2.47 ($P = .01$).

Pulse Response to Standard Work

With the controls the mean resting pulse rate was 71.3 and the mean pulse figures for the first four minutes after standard exercise were 113, 98, 92, 89. The means of the eighth, ninth and tenth minutes after exercise were taken together and averaged, the figure obtained being 81 (mean pulse area 105.4 \pm 40.9 s. d.). The corresponding results obtained with the 35 E.S. patients were resting 79, and the first four minutes after exercise, 136, 119, 113, 107. The average for the eighth, ninth and tenth minutes was 95 (mean pulse area 160.2 \pm 51.8 s. d.). It will be seen from figure 1 that when these results are plotted the curve of the two groups is almost parallel; the much greater pulse rise immediately after exercise in the E.S. patients compared with the controls is maintained, and results in a much slower pulse decrement. When Group 2 and Group 3 E.S. are treated separately it will be seen (figure 1) that the curve of the Group 2 E.S. patients lies above and the Group 3 below the curve of the total E.S. patients. Further, Table I shows the details of the pulse figures in Group 2 E.S. (mean pulse area 171.1 \pm 51.6 s. d.) and group 3 E.S. (mean pulse area 133.0 \pm 40.5 s. d.).

Correlation Between Lactate Rise and Pulse Response

The lactate and pulse responses to standard work are summarized in Table I. The lactate rise after standard work of the 35 controls and 35 E.S. patients was compared by the method of rank correlation with twelve different arrangements of the pulse figures. For the controls the best coefficient of correlation was .51, obtained by adding the pulse for the first minute post exercise and subtracting twice the resting pulse. Almost as good was the pulse area (see Method) giving a correlation coefficient of .45. The pulse area gave the highest coefficient of correlation (.55) with the lactate figures of the E.S. patients.

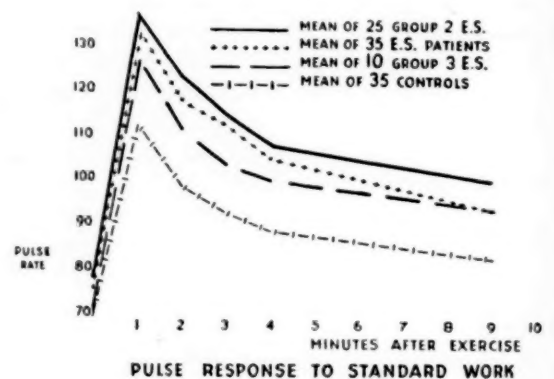


FIG. 1

Blood Lactate Rise After Maximal Work

In the 20 controls the mean lactate rise was 78.0 mgm.% \pm 16.3 s. d. (the mean resting value was 11.2 mgm.% \pm 2.79 s. d. and the mean maximal figure was 89.2 mgm.% \pm 17.01 s. d.).

The 20 E.S. patients gave a mean rise of lactate from the resting level 50.2 mgm.% \pm 11.06 s. d. (mean resting level 12.6 mgm.% \pm 3.1 s. d., and mean maximal figure 62.8 mgm.% \pm 11.28 s. d.). The significance of the difference between the means (C. R.) is significant, the difference being 6.22 ($P < .01$).

Of these 20 patients, 8 belonged to Group 3 E.S. and 12 to Group 2 E.S. Both groups gave almost similar results, the mean maximal lactate rise being 48.0 mgm.% in Group 3 and 51.1 mgm.% in Group 2.

Pulse Response to Maximal Work

The mean pulse rates for the resting pulse the first four minutes after exercise, and the average

of the eight to ten minute period following maximal work, were as follows: controls, 70, 156, 131, 119, 113, and 104; patients, 71, 154, 134, 125, 119, and 106. Figure 2 shows how closely the pulse curve of the controls and patients now correspond.

DISCUSSION

From the evidence afforded by the lactate and pulse response to standard exercise it would appear that Group 2 E.S. and Group 3 E.S. can be satisfactorily differentiated. In the case of the lactate rise Group 2 E.S. shows a statistically significantly higher lactate rise than the control group, while the mean lactate rise of Group 3 E.S. is actually lower than the mean of the controls. The post exercise pulse rise and decrement is higher in both

neurotic" group (Group 3) where the disability develops mainly as a result of emotional difficulties, receives support. It seems reasonable to suppose that the "constitutional" group should perform worse than the Group 3 patients, many of whom were reasonably good athletes before the onset of their symptoms. However, much work remains to be done before one can justifiably talk about a constitutional group. Studies of physique may help in this connection. In an earlier paper (1) we found that in a series of 100 E.S. patients 60% had had one or the other parent with symptoms similar to those of the patient, sometimes arising from heart disease, often from a neurosis. How much this can be taken as indicative of predisposition in a genetic sense and how much it represents an environmental factor is an open question.

TABLE I

STANDARD WORK

Lactate and pulse responses after standard exercise. Columns 1, 2, 3, 4, and 8-10 under Pulse represent minutes after completion of standard exercise

	Lactate mgm. %				Pulse						
	Rest.	Max.	Rise	S. D.	Rest.	1	2	3	4	8-10	Pulse area S. D.
Mean of 35 controls.....	11.0	32.1	21.1	11.79	71.3	113	98	92	89	81	105.4 40.9
Mean of 35 E. S.....	12.70	39.69	26.99	12.12	79.3	136	119	113	107	95	160.2 51.7
Mean of 25 E. S. Gr. 2.....	13.50	43.12	29.6	12.3	79.3	138	123	115	109	100	171.1 51.6
Mean of 10 E. S. Gr. 3.....	11.30	31.10	19.80	10.49	78.3	128	112	105	100	95	133.0 40.5

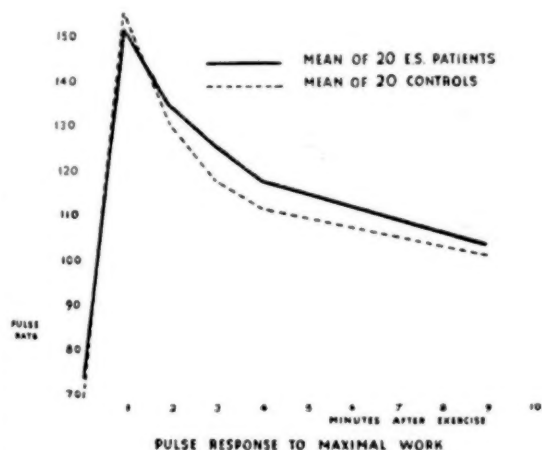


FIG. 2

groups than in the controls, the Group 3 E.S. being intermediate between the Group 2 E.S. and the controls. Thus the clinical differentiation of E.S. patients into a "constitutional" group (Group 2) with a lifelong history of poor exercise response and a tendency to symptoms of excessive vegetative disequilibrium in response to exertion of excitement from earliest recollection, and a "primarily

In considering the response to maximal work, it is clear that the lactate rise when the 20 E.S. patients exercised to complete exhaustion on the bicycle ergometer (mean rise $50.2 \text{ mgm. \%} \pm 5.74 \text{ s. d.}$) was significantly different from the response of the 20 controls (mean lactate rise $78.0 \text{ mgm. \%} \pm 8.15 \text{ s. d.}$). There was no real difference between Group 2 and Group 3 E.S. in this respect. Kuehr, Dill and Neufeld (3) have shown that, in running, the ordinary young man will stop from exhaustion when the lactate level in the blood has reached approximately 100 mgm. \% (*i.e.*, lactate rise of about 90 mgm. \% above the resting level). As more muscles are employed in running than in the type of ergometer we used, our lactate control figures are understandably somewhat lower than those of the Harvard Group. The results obtained suggest that E.S. patients (both Groups 2 and 3) give up exhausting physical work before they have reached a "physiological" end point. The fact that these patients typically dread the supposed ill effects of strenuous physical exercise because they fear the damage which may result to their hearts, etc., results in what amounts to an effort phobia.

SUMMARY

(1) A simple classification for different types of effort syndrome is outlined.

(2) Twenty-five Group 2 ("constitutional") effort syndromes showed a mean blood lactate rise of $28.9 \text{ mgm.}\% \pm 6.14 \text{ s.d.}$ after standard exercise on a bicycle ergometer. The corresponding figure for 35 normal controls was $21.1 \text{ mgm.}\% \pm 5.89 \text{ s.d.}$, which is significantly different.

(3) Ten Group 3 (psychogenically produced) effort syndromes did not show a significantly different lactate rise compared with the controls.

(4) When worked to exhaustion point on a bicycle ergometer 20 normal controls showed a mean

blood lactate rise of $78.0 \text{ mgm.}\% \pm 8.15 \text{ s.d.}$ Twenty E.S. patients gave a mean blood lactate rise of $50.2 \text{ mgm.}\% \pm 5.74 \text{ s.d.}$

(5) Pulse rise and decrement after standard work is highest in Group 2 E.S. and lowest in the normal controls, with Group 3 E.S. occupying an intermediate position.

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We are indebted to the Medical Research Council of Great Britain for a research grant.

A COMPARISON OF THE EXERCISE RESPONSE IN VARIOUS GROUPS OF NEUROTIC PATIENTS, AND A METHOD OF RAPID DETERMINATION OF OXYGEN IN EXPIRED AIR, USING A CATHAROMETER

MAXWELL JONES AND VERONICA MELLERSH

WITH THE TECHNICAL ASSISTANCE OF MONICA MUSGRAVE

METHOD

A standard exercise using a bicycle ergometer as described in the previous papers was used. The subject cycled for five minutes against a constant resistance (6,750 ft. lbs. of work per minute). The expired air was collected in 2 Douglas bags for the five minutes immediately post exercise; the expired air was analyzed for oxygen content by Haldane's method.

In 11 subjects the contents of each of the 2 bags was analyzed by Haldane's method and by a catharometer.* The latter technique is based on the principle that the rate of heat loss from a heated platinum wire depends on the thermal conductivity of the gas which surrounds it. Four platinum spirals in 4 chambers are arranged as the arms of a Wheatstone's Bridge: 2 chambers contain a standard air sample, the gas to be analyzed (expired air after removal of carbon dioxide and water) diffuses into the other 2 chambers. A definite electric current is passed through the circuit, heating the spirals; differences in thermal conductivity of the two gases causes a change of resistance of the spirals, throwing the Bridge out of balance. The imbalance is shown by the galvanometer, which is calibrated to give

direct readings of the percentage of oxygen in the gas sample tested. The technique is very much quicker and simpler than a Haldane gas analysis; it has been used extensively in industry for measuring the percentage of carbon dioxide in flue gases, etc., but, owing to the very similar conductivities of oxygen and nitrogen compared with carbon dioxide and nitrogen, has not been used with any degree of success for oxygen determinations in physiology.

The whole procedure, including the method for lactate assay by Friedmann's method, was similar to that described in Paper 1. Pulse area was obtained by counting the pulse for a whole minute for ten minutes post exercise; the pulse figures for the first four minutes post exercise, and the mean of the eighth, ninth and tenth minutes post exercise were then added and five times the resting pulse rate was subtracted from the total.

MATERIAL

Twenty normal controls and 10 anxiety states with somatic anxiety, but no complaint of effort intolerance, were used, and are the same people as were studied in Paper 1. To this were added 12 Group 2 effort syndromes (*i.e.*, cases with a life-long history of poor exercise response and excessive vegetative lability on excitement); 15 Group 3

* The Catharometer was built for us by the Cambridge Instrument Company, London, England.

effort syndromes (*i. e.*, patients whose effort intolerance has developed as part of a neurosis, in contrast to the more "constitutional" Group 2 effort syndrome); 10 patients with mild anxiety states of a chronic nature who had no somatic anxiety symptoms and no complaint of effort intolerance; 12 cases with conversion hysteria of the more chronic type with no clinical evidence of anxiety. The controls were a random sample of young soldiers from a nearby barracks; all were fitters and not undergoing any strenuous physical training. Ages ranged from 18 to 35, with a mean of 24.7, and weights ranged from 120 to 154 lbs., with a mean of 143.4 lbs. The patients had an age and weight distribu-

$P < .1$) do not appear to be significantly different from the normal controls. The mean lactate rise for the 20 controls is $11.1 \text{ mgm.}\% \pm 6.2 \text{ s. d.}$, and for the total 59 neurotic patients $17.7 \text{ mgm.}\% \pm 17.7 \text{ (C. R. 3.8)}$.

Pulse Area: As will be seen from Table I, the group of hysterics (C. R. 1.1; $P > .1$), does not appear to differ significantly from the normal controls. The most striking differences are found in the anxiety states (C. R. 5.8; $P > .01$), and in the E. S. Group 2 (C. R. 4.9; $P > .01$). The mean pulse area for the 20 controls was $86 \pm 35.8 \text{ s. d.}$, and for the total 59 neurotic patients $136 \pm 42.7 \text{ (C. R. 5.0)}$.

TABLE I

SIGNIFICANCE OF THE DIFFERENCE OF THE MEANS IN OXYGEN UPTAKE, LACTATE RISE AND PULSE AREA, BETWEEN THE NORMAL CONTROL GROUP AND 5 DIFFERENT GROUPS OF NEUROTIC PATIENTS, FOR 5 MINUTES IMMEDIATELY POST (STANDARD) EXERCISE

	Oxygen uptake			Lactate rise			Pulse area		
	c.c.'s per min.	S. D.	C. R.	Mgm. %	S. D.	C. R.	Pulse	S. D.	C. R.
20 normal controls.....	586	35.9		11.1	6.2		86	35.8	
12 E. S. group 2.....	718	101.1	4.2	18.0	6.9	2.8	145	30.6	4.9
15 E. S. group 3.....	673	70.5	4.2	19.9	8.8	3.1	150	66.3	3.3
10 somatic anxiety.....	703	126.0	2.7	15.8	7.8	1.6	116	34.7	2.1
12 hysterics.....	654	51.5	3.9	15.0	6.2	1.6	100	30.5	1.1
10 anxiety states.....	683	84.0	3.3	19.2	7.4	2.8	166	33.2	5.8
Total 59 Neurotics.....	685	86.2	7.1	17.7	7.7	3.8	136	42.7	5.0

tion similar to the controls, and all were free from any known organic disease.

RESULTS

Oxygen Uptake: Table I shows the mean oxygen uptake for the five minutes post exercise in the normal controls and five neurotic groups tested. It will be seen that all five groups of neurotics show a significantly greater oxygen uptake per minute than do the normal controls. The difference is most marked in Group 3 E. S. (critical ratio 4.2; $P < .01$), and in the E. S. Group 2 (C. R. 4.2; $P < .01$), and least striking in the somatic anxiety group (C. R. 2.7; $P < .05$). The mean oxygen uptake for the 20 controls is $586 \text{ c.c. per minute} \pm 35.9 \text{ s. d.}$, and for the total 59 neurotic patients $685 \text{ c.c. per minute} \pm 86.2 \text{ s. d. (C. R. 7.1)}$.

Lactate Rise: Table I shows the mean lactate rise following standard exercise. Both groups of E. S. show significant differences (E. S. Group 3, C. R. 3.1; $P < .01$, E. S. Group 2, C. R. 2.8; $P < .01$), and the anxiety states are also significantly different (C. R. 2.8; $P < .01$). The somatic anxiety states (C. R. 1.6; $P < .1$) and the hysterics (C. R. 1.6;

COMPARISON OF GAS ANALYSIS DONE BY HALDANE AND CATHAROMETER METHODS

Table II shows the comparison of oxygen uptake expressed in c.c.'s of oxygen per minute in the first and second Douglas bags measured by Haldane and Catharometer methods. Subject 7 shows the

TABLE II

COMPARISON OF OXYGEN UPTAKE EXPRESSED AS C.C.'S PER MINUTE, MEASURED BY CATHAROMETER AND HALDANE'S METHODS. BAG 1 CONTAINED EXPIRED AIR FOR FIRST $1\frac{1}{2}$ MINUTES POST EXERCISE AND BAG 2 FOR THE NEXT $3\frac{1}{2}$ MINUTES POST EXERCISE

Subject	Bag 1		Bag 2	
	Catharometer	Haldane's	Catharometer	Haldane's
1	911	958	378	372
2	1104	1129	510	507
3	1068	1063	581	575
4	983	972	425	416
5	943	918	409	418
6	994	1006	350	358
7	1265	1387	361	341
8	871	852	291	296
9	950	944	473	486
10	960	944	548	550
11	1251	1230	702	710

greatest difference, the Haldane method giving a reading of 341 c.c. O₂ per minute, and the Catharometer a reading of 361 c.c. O₂ per minute (a difference of 6%). Subject 1 gives a 5% difference with the two methods—958 c.c. O₂ per minute with the Haldane method and 911 c.c. O₂ per minute with Catharometer. The 22 estimations done by both methods give a product moment correlation of $r=0.996$.

DISCUSSION

It will be seen (Table I) that of the three tests used—oxygen uptake, lactate rise and pulse area post exercise—only the oxygen uptake shows a significant difference ($P<.05$) between all five groups of neurotics and the normal controls. It has already been suggested (Paper 1) that the lactate rise would be a more accurate test of physical efficiency if a more strenuous standard exercise, incurring a considerably larger oxygen debt, had been used. At moderate work, such as we have employed, the oxygen uptake is understandably a more accurate index. Both methods (oxygen uptake and lactate rise) gave high reliability coefficients on repeated testing (see Paper 1), but the coefficient of correlation for repeated tests of pulse area was not nearly so good. These results support the view already expressed in the previous papers that oxygen uptake is the best of the methods we have used to assess physical efficiency. On the basis of this test all five groups of neurotics perform much worse than the normal controls, and poor exercise response appears to be an attribute of neurotic patients in general.

In Paper 2 it was shown that E. S. Group 2 showed a significantly higher lactate rise than E. S. Group 3; this finding is not substantiated with the groups studied here, the Group 3 E. S. patients showing a slightly higher mean lactate rise than the E. S. Group 2 (19.9 mgm.% compared with 18.0 mgm.%): the mean oxygen uptake for the group 2 E. S., (101.0 c.c. oxygen per minute) is considerably higher than the Group 3 E. S. (70.5 c.c. oxygen per minute), although the C.R.'s are the same (Table I). Our findings suggest that it is not possible to differentiate between the two groups of E. S. by means of the tests used.

The results shown in Table II indicate that the Catharometer correlates highly with the Haldane method of oxygen analysis. The Catharometer method is considerably quicker and simpler than

Haldane's method; once the Catharometer has "warmed up" it is only a matter of minutes to read off the percentage of oxygen in the gas sample being tested. This technique has immense possibilities in any field of work where oxygen assays are required. The simplest application in clinical medicine is to basal metabolism estimations; even the best spirometer methods with a motor driven air circuit are oppressive to some subjects, and much less satisfactory for this reason than breathing into a Douglas bag. The combination of Catharometer and Douglas bag seems to us to be preferable to spirometer methods, being pleasanter for the patient, simpler for ward procedure (a Douglas bag is easier to transport than a spirometer) and as quick as the other method. For single estimations of this kind a much higher degree of accuracy than we obtained would be necessary (*i.e.*, less than a 6% error compared with the Haldane method). We were dealing with groups of patients and raised metabolism post exercise, and the differences were so large that we could afford to allow a 6% error. The experimental error could probably be greatly reduced by making corrections for temperature and pressure of the gas in the Douglas bag, and also measuring the volume of carbon dioxide in the expired air, perhaps by means of another catharometer.

SUMMARY

1. The exercise response to standard work on a bicycle ergometer of five different groups of neurotic patients (E. S. Group 2, E. S. Group 3, somatic anxiety states, anxiety states without demonstrable somatic anxiety, and patients with conversion hysteria) is compared with 20 normal controls, regarding oxygen uptake, lactate rise and pulse area.

2. All five groups are significantly worse than the controls when oxygen uptake is compared, but this differentiation is not so complete with the lactate rise and pulse area. The oxygen uptake figures indicate that poor exercise response is an attribute of neurotic patients in general.

3. A catharometer is a simple, quick and accurate method for oxygen estimation, and compared with Haldane's method of gas analysis on 22 gas samples gave a product moment correlation of 0.996.

We are indebted to the Medical Research Council of Great Britain for a grant to carry on this work.

COUNTER-TRANSFERENCE IN THE TECHNIQUE OF MEDICAL PRACTICE

BERTRAM D. LEWIN, M.D.

TRANSFERENCE AND COUNTER-TRANSFERENCE

Recent medical literature has introduced many psychoanalytic concepts to the larger medical world, among others that of the transference (3, 1).¹ Those interested in the psychosomatic approach to illness have taught that the medical patient has a relation to his medical man which resembles a psychoanalytic transference. The patient comes to the doctor with an attitude that has a history. It is a new edition of his attitudes to many previous physicians, but also to teachers, parents and other authoritative persons, or to persons who have figured in some important way in his life. Much of this attitude is unconscious, but, for all that, effective in furthering or hindering the therapeutic efforts. Hence medical men are becoming aware of its role in diagnosis and therapy.

In analytic technique, a consideration of the transference would be incomplete without, at the same time, some consideration of the counter-transference, its counterpart. Broadly speaking, the counter-transference is the attitude, rational or irrational, scientific or emotional, conscious or unconscious, appropriate or anachronistic, which the doctor has towards his patients. It might therefore be profitable to supplement what has been written about the "psychosomatic" or general medical transference by a few remarks about the corresponding counter-transference, so far as this topic can be treated in general and so far as it influences the common medical techniques.

COUNTER-TRANSFERENCE IN PSYCHOANALYSIS

There are several good discussions of the counter-transference in psychoanalytic literature. For simplicity and practicality, perhaps the best is that of Ferenczi (4). Ferenczi states that in mastering the counter-transference an analyst goes through a three-stage development. The first stage is due to the fact that shortly before, during his training, he was himself an analytic patient. He therefore unconsciously identifies himself with his patients, becomes their champion, and wants their wishes

fulfilled. Nowadays, the analyst's teachers help him through this stage, but even by himself, the indulgent analyst learns that his attitude hampers his analytic effort. If he then resists this attitude and represses it, he goes into Ferenczi's second stage, that of "counter-resistance." He overcomes his identification by setting up the contrary attitude of overdetachment—a Charybdis in which he loses contact with his patients' unconscious. Instead of, so to say, understanding his patients too well, he now cannot understand them at all. Finally, he strikes a balance between the two polarities: in a sublimated counter-transference, the analyst identifies or detaches himself to the degree and in the manner required for his rational purposes. He becomes free to apply the appropriate, tested technique.

COUNTER-TRANSFERENCE IN MEDICINE GENERALLY

The counter-transference of the physician who works in other fields of medicine, or for that matter of the analyst in his medical school days, undergoes a different development. As a medical student, the doctor begins his professional training not on the analytic couch, but as a dissector in the anatomy laboratory. He immediately has a "patient," the cadaver. The cadaver, he recognizes, is not meant to be an individual but a type. The manual skill and knowledge he gains by dissecting are to be transferred later to living patients. The student is supposed to be emotionally detached from the cadaver and usually assumes uncritically that he is. But psychologically considered, this is hardly possible. The student derives much satisfaction from his work. His relationship to the cadaver is an outlet for many sublimated, active, libidinal drives, as well as those of mastery and power. The cadaver, completely passive and unresistant to the dissector's intentions, is an ideal object for such satisfactions. Intended to be a prototype of all future patients in certain rational respects, the cadaver easily comes to be the student's ideal of a patient in all respects.

PSYCHOLOGICAL CONSEQUENCE OF ANATOMICAL COURSES AND PRECLINICAL WORK

To compare the medical student's initial situation with that given in Ferenczi's scheme, we find

¹ Some of the ideas to be presented in this paper were expressed in my review of Binger's book. *Psychoanalyt. Quart.*, 14:394, 1945.

him not in an identification with his first medical object, but in a sublimated personal relationship. For our purpose it is unnecessary to discuss neurotic or perverse breakdowns of the sublimation (2). But it should be noted that at this stage the relationship has nothing to do with death wishes such as we encounter in psychoanalysis. The infantile wish that a scolding nurse or an inconvenient sibling should "die"—that is, go away and leave one alone—has no bearing on the relationship to a real corpse. The deadness of the cadaver is an attribute, a quality, desirable for many subjective reasons. That the cadaver was once alive is psychologically of no importance. In the fourteenth century, the Church took care to remind students of this fact so that at the School of Salerno, when anatomy was young, the students said mass each morning for the salvation of the cadaver's soul. But in the same century, Chaucer's Doctor of Physick read "Ypocras, old Galien," the pagans and Avicenna; and his study was but little of the Bible. It has been a long time since medical students have thought about the cadaver's soul.

Pathology and physiology follow anatomy, but neither study alters the student's relationship to his objects. In the autopsy room he sees a series of cadavers; in other laboratories a variety of small animals, frogs, cats, and dogs. But the little animals are not regarded as individuals, as pets or creatures with whom one may identify one's self. They too are partial prototypes of the future human patients; yet predominantly they are so many "preparations"—machines and test-tubes—with which one may do what one wishes, usually after they are anesthetized or taken apart.

TRANSPOSING PRECLINICAL ATTITUDES TO THE CLINIC THE PATIENT AS CADAVER

The preclinical studies prepare the student to apply laboratory knowledge and skills to his human patients, often directly. The scalpel he used on the cadaver is now to be used on his surgical patients; the digitalis he administered to his pharmacological laboratory "preparation"—a frog or a cat—is to be prescribed for cardiac "cases." He must be as confident and as unruffled in using the knife or the drug clinically as when he worked in the laboratory. It is this calm assurance which Freud had in mind when he advised young analysts to observe their patients with the coolness of a surgeon (*mit chirurgischer Kälte*). But the surgeon too must acquire this coolness; he and other clinicians do so in part because of their preclinical state of mind. Uncon-

sciously, along with skills and knowledge, much of the psychological relationship to the cadaver is carried over to living patients. Where these differ from preclinical objects, the clinician may feel a dissatisfaction or tension, which could be formulated as a longing for his original dead patient.

Restricting our inquiry to normal sublimations, we see that this wish, that one were working with a cadaver, has promoted many technical advances in medical practice, and has brought about important innovations. The wish that the patient might be as amenable to dissection as the cadaver led to the invention of general anesthesia. Such at any rate must have been the theory of the "Father of Physiology," the illustrious and neurotic Magendie, who startled his colleagues by opposing the use of ether in these words:

"For some weeks, a certain number of surgeons have set themselves to experiment on man, and for an undoubtedly praiseworthy purpose—that of performing operations without pain—they intoxicate their patients to the point of reducing them, so to speak, to the state of a cadaver which one can slice and cut at will without causing pain" (6). He added amid shocked laughter that he would never permit his wife or daughter to be anesthetized, for "certain surgeons" might be tempted to take sexual advantage of anesthetized female patients.² But in the end, the normal opinion of Velpeau, whom Magendie had attacked, prevailed. The usefulness of reducing patients to the "state of a cadaver" could not be denied, regardless of the unconscious.

Another useful result of the wish to restore the dissecting room situation was the introduction into the surgical theater of the preservatives used in anatomy, as antiseptics. The first of these was phenol; its odor enhanced the illusion of the anesthetized patients' lifelessness. The gallows' humor of the anatomy table turned up on the wards as a hearty bedside manner, for which certain physicians became famous. Several of these had spent long years previous to their clinical appointment as anatomists and pathologists.

² Magendie's confession of necrophilic fantasies came rather late in life. His great teacher, Bichat, was an anatomist who dissected thousands of cadavers. In breaking with Bichat, Magendie imposed a taboo on himself against using any but living material. He rationalized his personal conflict into a theoretical schism between "anatomists" and "physiologists," reminiscent of many present-day pseudo-conflicts. However, he treated his laboratory animals, and sometimes his patients, as if they were without life or feeling; to such an extent that after a demonstration of vivisections in London, he was attacked in Commons as a "monster."

FIXATION ON THE CADAVER AND "THERAPEUTIC NIHILISM"

The fixation on the corpse expressed itself in internal medicine as well as in the surgical specialties. In many of the best hospitals, at one time, therapy, in theory, was considered irrational. Therapeutic nihilism meant that after a thorough "examination" (Laennec's adumbration of the autopsy) and the "diagnosis" (the guess as to what would be found there), there was nothing to do but wait for the clinical pathological conference. In some schools the cadaver was percussed again and the findings mapped by pins just before the autopsy.

CONFLICT: PATIENT AS CADAVER, OR AS HUMAN BEING LIKE THE PHYSICIAN (IDENTIFICATION MECHANISM)

The transition from the preclinical patients, with whom one does not identify one's self, to the human beings in the clinic with whom one does, is marked by conflict. Stage one tries to find representation in stage two. The conflict between the "pure" anatomist's position and the humanistic one is to be found in many extensive rationalizations. The preference for the dead patient led many to insist that the dead brain alone was the real key to the living mind. "No mental disease," it was firmly asserted, "without brain disease"—meaning lesions—and when the lesions could not be found, unfortunately they were only too often imagined. The heat which arises from so many useless clashes between the proponents of "organic" and "psychological" medicine might not appear, if it were realized that the main issue was a matter of preference, an emotional preference for the dead or the live patient. The idea of psychic determinism, to leave aside its pragmatic justification, is emotionally acceptable to medical men because they appreciate the physical determinism of the inanimate.

RESOLUTION OF CONFLICT: SUBLIMATED FLEXIBLE COUNTER-TRANSFERENCE

In view of the fruitful technical and theoretical sublimations of the wish to have a dead patient, no one will deny its great dynamic value in medical science. Yet it is clear that in the final sublimation of medical practice, the doctor must be sufficiently flexible to include both of his attitudes in his relationship to his patients, and be prepared to shift from one to the other. The surgeon treats his anesthetized patients as quasi-cadavers; but in their convalescence as if they were alive. To under-

stand them fully he must identify himself with them. As a therapist, he may need to employ (or direct that some one should employ) that refinement of the natural capacity for identification, which, as Ferenczi indicated, is psychoanalytic technique, and one might add psychological medical technique in general. The medical man's counter-transference problem is in principle not different from the psychoanalyst's. In his sublimated counter-transference, he identifies himself with his patients, or dissociates himself from them, in accord with the demands of the rational diagnostic and therapeutic aims.

COUNTER-TRANSFERENCE BY IDENTIFICATION: THE PATIENT AS A HUMAN BEING

That the doctor reacts to his patients as human beings and considers them to be like himself sounds more banal than informative. Obviously long before the doctor learned of stethoscopes and clinical pathological conferences, he knew what it meant to be ill. One thinks immediately of many famous names in medicine, in tuberculosis for example, who were originally patients. But this is a special conspicuous example of a general situation; for there is surely no medical man who was not at one time a sick child. Like Ferenczi's analytic beginner, therefore, every doctor knows by experience what patients want and how they feel; and if this knowledge consciously recedes as his attention becomes more and more deflected to technical and scientific matters, it none the less unconsciously persists. He will have, in other words, not only ordinary conscious sympathy with the sick, but he will unconsciously know a good deal about the patient's needs and feelings.

ILLNESS AND AGGRESSION

A most interesting and important bit of unconscious knowledge which doctors have about the patients' conscious or unconscious minds is that sick people are aggressive, either to the environment or to themselves. Even in the "good patient," who spares his doctor and his environment, there is somewhere at the core a howling, enraged, insulted child. The normal doctor of course does not take his patients' aggressions personally; yet he registers them unconsciously. He must cope with them somehow psychologically. Except among the most primitive peoples, the doctor distinguishes between his patient's personality and his aggressions. It is true that the Central Australians until recently, as Róheim tells us, buried their sick kinsmen alive

and feared them still in the grave (7). But even so backward a people as the Siberian Yakuts make this distinction: the Yakut shaman works himself into a terrible rage and leaps and shouts at the patient. Not at the patient either, it seems, for the shaman believes that he is scaring a devil out of him.³ The aggression is segregated from the patient's personality in the shaman's mind, as the "disease entity" is segregated from the personality by more sophisticated medical thinkers. The shaman counteracts the patient's aggression by a literal counter action: the devil scares him, he scares the devil back. The shaman was in danger. The whole history of primitive medicine testifies to the primitive unconscious feeling that in the presence of the sick one is in danger. Clinical psychoanalysis, studying germ phobias and morbid fears of disease, substantiates the widespread existence of this thesis in the unconscious.

COUNTER-TRANSFERENCE AGGRESSION AND ITS SUBLIMATION IN TECHNIQUE

Danger engenders defensive measures, aggression counter-aggression; but happily doctors no longer may conscientiously simply attack their patients, as Dr. Willis flogged the psychotic George III, with the considered approval of a good part of the medical world of the time. Ordinarily the doctor does not need such violent measures for the illnesses he encounters. For a headache, he can prescribe aspirin, that is to say, he can poison the patient slightly, but by this very act the patient's pain vanishes and so does the doctor's danger. In the same act the patient is helped and the doctor has expressed his sublimated counter-aggression. For a more severe pain the doctor could use morphine and perhaps put the patient to sleep, reducing him, as Magendie put it, to the state of a cadaver. The doctor's sublimated act, which aids the patient, nevertheless includes an unconscious regressive wish fulfillment. For pains not amenable to drugs, he may sever nervous connections or remove organs; that is, destroy part of the patient. As a very extreme measure (but here the doctor would have much doubt and conflict) he might be tempted to think of euthanasia, which would assimilate the patient to the first object of the doctor's experience. To paraphrase Rado, the patient would then be a "purely good" patient. Dr.

Frankenstein's monster, the sick aggressive life that was added to the cadaver, is the "purely bad" patient.

It is not the purpose of this paper to discuss the motives which may unconsciously determine the doctor's choice of a profession, nor the types of satisfaction which his practice may unconsciously furnish him (9, 10). Our interest is centered on his counter-transference, its nature and dynamic effect in typical therapeutic situations. The doctor's aggression was considered solely in its technical counter-transference aspect.

DEFENSE TECHNIQUE: PLACATION

A common method of dealing with the patient is of course placation. The placating act usually takes the form of an indulgence. The doctor identifies himself with the patient, knows what he wants and symbolically gives it to him. Thus Brown-Séquard surrendered to a very simple impulse: to prescribe testis against advancing age was a direct indulging, if symbolic, response; and it is well known that Brown-Séquard was his own first patient. In the subsequent history of endocrinology something, perhaps something displaced from another matter entirely, seems to have disturbed the doctor's ability to repeat Brown-Séquard's beautiful simplicity. For, very soon, in that science there developed a massive obsessional system for giving a substance, offsetting it partially by a second, and opposing the resultant action of the two by still another. But the counter-transference that develops into a neurosis is a special case beyond the scope of this paper.

Associated with the desire to placate are other identification motives for indulging the patient. Sometimes, in the prescription of certain diets, it is as if the doctor read the patient's unconscious. After the birth of a son, one of my patients developed gastric indigestion, and it was interesting and instructive to note how closely his prescribed diet paralleled that of his baby. He was put on milk; then through gruels and purees he and the baby finally worked up to solid foods.

GUILT

It would be expected that some or much of the doctor's counter-aggression would take the form of unconscious guilt, which ordinarily is not hard to alleviate. Besides the rational and sublimated assuagement which comes from the proper exer-

³ Korolenko, V. G.: *Maikar's Dream*. This is a tale, but is based on Korolenko's experiences among the Yakuts while in exile.

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cise of so punishing a profession, certain elements in ordinary practice serve to clear the doctor of guilt. The taking of an anamnesis is one such method of clearing the doctor of guilt. Its effect is to throw the guilt back on the patient. The anamnesis brings home to the patient (and the doctor) that the patient was responsible for the disease. What did you eat? What did you do to cause the pain? How did you fall when you broke your arm? When were you last exposed to venereal disease? The patient's unconscious aggression turns back on himself; and if it does not the doctor has a more difficult transference problem.

INSURANCE. OTHER ASPECTS OF COUNTER-TRANSFERENCE

Most of the doctor's fear of the patients' aggressions is unconscious, yet it finds rational expression in the institution of insurance against malpractice suits. Many innocent doctors have been sued, attacked, even killed, because some paranoid patient held them accountable for not curing him, or more likely for not giving him the satisfactions he unconsciously desired. The patient's aggression is rarely so effective; he is a weeping child rather than a devil. It is the aggression of one who has himself been hurt or punished; it is usually unconscious; and offset by the defensive resources of the patient's ego. Authorities referred to above (and others) have sufficiently considered the role of passive strivings in patients. Ordinarily such strivings do not set a problem in the physician's technique, but are more apt to affect him as an individual. His technical training and his sense of reality usually provide against too much concurrence in his patients' belief in his omniscience. If a physician becomes conceited, it is due to his own needs and not to his practice. Indeed, one good effect of our present preclinical education is the weakening of the student's propensity to identify himself with the Father-Doctor of Luke Fildes's well-known painting. Further discussion would lead to matters ably considered by Simmel, Nunberg and others (5, 8).

VALUE OF CONSCIOUS INSIGHT IN TRANSFERENCE-COUNTER-TRANSFERENCE RELATIONS

The doctor cannot of course master his counter-transference impulses by considering them in the abstract. Psychoanalytic training courses provide that the beginning analyst shall analyze his first cases under the supervision of an experienced teacher. Under such supervision, besides being taught correct analytic technique, he is assisted in becoming aware of, and solving, some of his individual counter-transference problems. The medical student might conceivably profit from a similar type of instruction. He might learn how his own personality assists or hampers his understanding and treatment of patients, or where his emotional response leads him to err. As Dunbar puts it, it is important to know not only what the doctor does to the patient, but also what the patient does to the doctor.

Without special instruction, it must be admitted, the healthy physician comes to terms somehow with his main counter-transference problems. But as he becomes increasingly aware of the nature of transference he will become more aware of its counterpart or reflection in himself. The best "bed-side manner" is not a good substitute for such awareness. Conscious insight is ultimately the best and most efficient means of solving a psychological problem.

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REVIEWS, ABSTRACTS, NOTES, AND CORRESPONDENCE

THE THERAPY OF PEPTIC ULCER FROM THE POINT OF VIEW OF THE INTERNIST *

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Because of the special interests of the group to whom this paper is presented, an internist's concept of the peptic ulcer problem is offered as being one primarily connected with internal medicine but having very important and fundamental psychological aspects. The term "peptic ulcer" is used to mean a chronic, incurable disease, characterized by ulceration of the stomach or duodenum and subject to intermittent relief from symptoms, as well as to unpredictable, or frequently predictable, recurrences. "Incurable" means exactly that,—namely, a condition which, while capable of being handled during the acute phases, does not respond to treatment in such a manner as to provide a complete and lasting cure. Complete cures from the point of view of the clinical picture of peptic ulcer are the rare exception; recurrences are the rule. Undoubtedly acute ulcers do occur, heal and never recur. These are not only exceptional but often are unrecognizable except by the pathologist, who upon examination of the stomach at a later date, at autopsy possibly, finds the scar of an old healed ulcer. In such a case, the patient may have experienced at some time a short period of abdominal or epigastric distress, not characteristic of ulcer and therefore not suspected of being nor diagnosed as ulcer.

The history of ulcer can be epitomized as follows: it is characterized by remissions and relapses, by epigastric pain bearing a definite relationship to the intake of food and relieved by food or alkali. This typical story of pain exists in the vast majority of patients with diagnosable ulcer coming to the physician. It is important, however, to stress the fact that now as never before when ulcers are seen occurring in younger men, the history may be quite atypical, at least for the first weeks to months; the diagnosis can only be suspected, and then subsequently proved by careful radiological examination. Frequently a patient with peptic ulcer develops a characteristic story only after the disease

is of some duration. Once the condition is established, however, the sequence already alluded to is nearly always to be found if adequate questions are asked.

The present discussion will be limited to duodenal ulcer inasmuch as gastric ulcer poses a very special question because it frequently is indistinguishable from gastric cancer, and cancer as a second and more serious diagnosis always must be entertained in the presence of a gastric lesion. For practical purposes, if the threat of cancer has been ruled out, gastric ulcer and duodenal ulcer present similar histories and are treated in similar fashion. The diagnosis is made (1) by the history and (2) by careful x-ray examination. Physical examination contributes little or nothing to the diagnosis. Laboratory procedures, being also ineffective for diagnostic purposes, are a waste of time. A direct approach to the subject, first by a meticulous history and second by an equally careful radiologic examination, is the only way to make an accurate diagnosis of peptic ulcer.

Therapy should be considered under two entirely separate headings. The first should deal with treatment of the acute, active ulcer uncomplicated by obstruction, hemorrhage or perforation. The second, even more important, concerns the treatment of the patient who has an ulcer, who has healed it and who must be taught, if possible, to control the condition and prevent recurrences. This is the real challenge of the ulcer problem and the question which is particularly pertinent in the present discussion. Unless these two phases of treatment are clearly differentiated, confusion is certain to result inasmuch as the emphasis in each differs fundamentally.

The treatment of the acute phase is well-recognized and needs little amplification. It consists of adequate physical and emotional rest, a dietary program based upon the fundamental conception of frequent, simple, small feedings, taken on time, and proper medication. Medication is directed first to the control of what is going on in the end-organs, the stomach and duodenum,—that is, the so-called control of gastric acidity by one or another

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antacid; second, toward the control of nervous stimuli delivered to the motor and secretory cells of the stomach itself by means of belladonna, atropine or other spasmolytic drugs; and third, toward the control of the higher levels of the nervous system by sedation with one of the barbiturates. During the acute phase the patient must be made to understand his immediate problem, and by reassurance be relieved of his anxiety. Subsequently, he must be given a realization of the problem which faces him in the future. Obviously, if complications such as perforation, hemorrhage or obstruction occur, they must be treated on their own merits, but, regardless of their importance, they will not be discussed at this time.

The second phase of the ulcer problem offers a much more important challenge and one which many physicians have failed to meet. In the first place, there seems to be a lack of willingness to acquaint the patient with the fact that he is confronted with the problem of a chronic disease which, because of its tendency to recur and various other factors, is essentially incurable. Too frequently the physician is satisfied with the healing of the ulcer, subsequent treatment being casual, superficial and of short duration. Occasionally treatment may be continued over a long period but only as it includes the dietary and medicinal principles that apply primarily to the acute phase of ulcer. Diet and medicinal measures alone will not control and prevent relapse after the original ulcer has healed. In order adequately to protect against future recurrences, it is of fundamental importance to develop an understanding of the background on which the ulcer problem is planted.

What kind of patient develops an ulcer? Anthropologically, he is usually a slender individual, with a narrow intercostal angle, a scaphoid abdomen, low-normal blood pressure, low-normal basal metabolic rate, frequently overactive reflexes, dilated pupils, and an obviously unstable autonomic nervous system, as exhibited by dermatographia, sweating, and the like. There are of course exceptions, but they are not common. The ulcer patient probably falls psychologically into a fairly constant pattern. He is not a "neurotic" in the usually accepted sense of the word, but he is a person who is different from many of his fellows. This is a point as a rule overlooked by his physician, whose interest still too commonly centers about the so-called "practical" measures, such as the control of acid, spasm, and so forth, to the complete exclusion of the individual.

As to whether or not an ulcer patient is a psy-

choneurotic is a question which, to avoid splitting hairs on a definition, will not be argued. The following description of a psychoneurosis, however, suggests that a typical ulcer patient does not come under this heading.

Psychoneurosis, or neurosis, is a term used to describe various syndromes or combinations of symptoms found in patients. The term is not synonymous with the popular expression "neurotic," which has no specific meaning. A patient may be said to have a neurosis if he has anxiety neurosis, hysteria, psychasthenia, or hypochondriasis. The definitions of these disorders consist of listings of their respective signs and symptoms. For instance, in anxiety neurosis, patients complain predominantly of palpitation, dyspnea, smothering, anxiousness, and irritability; in hysteria, of paralyzed arms, odd gaits, vomiting, and the like; in psychasthenia, of obsessions, compulsions, and phobias; in hypochondriasis, of marked preoccupations with symptoms and bodily functions. In other words, the term neurosis is useful only as a heading for one of this group of illnesses.

An ulcer patient does not have a psychoneurosis unless he shows evidence indicating the presence of one or another of these syndromes. Personality problems, difficulties in getting along in the world, annoying personal behavior, or even the presence of a conscious conflict is not enough to warrant the diagnosis; actual symptoms must be present.

In spite of the fact that an ulcer patient is not necessarily a neurotic, he is undoubtedly a rather special type of individual from the point of view of his nervous make-up. Almost invariably he is a tense, or intense person, enthusiastic, conscientious, more or less of a perfectionist, a go-getter, a real driver; and at times he exhibits in full the psychological picture attributed to manic depressive psychosis. In the occasional ulcer patient with cyclic depression, the ulcer usually is quiescent in the manic phase; when depression becomes manifest, ulcer recurrences are common. As a rule, an ulcer patient takes his pain and drives beyond or through it until he cannot stand it any longer. He is not a psychologically over-reactive person, but on the contrary, he tries to disregard his discomfort. That behind ulcer activation a most important factor is seated high in the central nervous system seems beyond question. It appears clear that the higher emotional levels in the brain react, probably through the hypothalamic area, over the autonomic nervous system. They affect the gastric or duodenal physi-

ology in the patient to such an extent that under certain circumstances of extreme tension or anxiety ulceration takes place.

The work of Cushing, Keller, Hare, and d'Amour, of Watts and Fulton, of Banting and Hall, and of others needs little comment in this particular assembly. Clinically and experimentally, it is well-recognized that brain lesions can be associated with ulcerations of the gastric and duodenal mucosa. That central influences affect the physiological activity of the stomach has long been appreciated. The profound observations of Beaumont, brought up to date and demonstrated beautifully by Wolff and his collaborators, by Cannon, by Alvarez, and by others, show clearly the effect of the emotions on the vascular, motor and secretory functions of the upper digestive tract. The importance of the mediation of abnormal nervous influences upon the stomach or duodenum is indirectly implied in the relief so frequently obtained by the patient with uncomplicated ulcer by the use of atropine, belladonna, or other spasmolytic drugs which affect the nerve endings of the parasympathetic system in the gastrointestinal tract. Furthermore, the effect of vagus resection is striking evidence of the influence of the autonomic nervous system, or at least of one branch of it, upon gastric activity. This was demonstrated more or less clearly by Brodie in 1814, and in 1894 by Pavlov; Latarjet, a French surgeon, in 1922 reported favorable ulcer therapy by vagus resection, and this was also recognized by the Mount Sinai group. Recently, it has been even more clearly shown by Dragsted of Chicago and by Moore at the Massachusetts General Hospital. Moore's studies showed the inhibition of gastric secretory responses to insulin, food, and the like, in an ulcer patient by bilateral resection of the vagus nerve above the diaphragm. Whatever the ultimate results of bilateral vagotomy may be, physiologically it is of the utmost importance to recognize its immediate and rather prolonged effects. When all the fibers of the vagus supplying the stomach and duodenum are cut above the diaphragm, a procedure only partially accomplished by the earlier investigators who divided the nerves below the diaphragm, it is clear that secretory, motor and vascular activity are profoundly influenced in the ulcer patient.

It is difficult to believe that the recurrences of ulcer, even after so radical and mutilating an operation as subtotal gastrectomy, can be due to any other factors than those which constituted the original causes present in the vulnerable ulcer patient. These causes must be laid in part to distur-

bances originating at high central nervous system levels. The work of Ivy, Sandweiss, and others, in regard to enterogastrone and urogastrone cannot be passed over. Although the significance of their findings is still not entirely clear, there can be little doubt that an important hormonal control of the stomach, its secretions, motor activity, and vascularity, with corresponding repercussions on duodenal physiology, is present in ulcer patients differentiating them from normal individuals. Whether these hormonal effects are mediated in part by central nervous system and autonomic nervous system activity is still not clear, but there is reason to believe that this may be true. The fact that these gastric inhibiting substances are not found in important amounts in the ulcer patient would seem to indicate that he is anthropologically and physiologically in a class somewhat by himself, and is therefore a vulnerable person. For this reason, anyone who fails to take a fundamental interest in the individual with an ulcer as a psychological and physiological entity fails miserably in visualizing the problem and in controlling it. Unfortunately, complete control of the individual is rarely obtained because of incidents, which being unforeseen, cannot be planned for in advance.

It is because of these components that the Gastro-Intestinal Clinic at the Massachusetts General Hospital is set up as a team comprised of a physician, a surgeon, a psychiatrist, a trained Social Service worker, and a dietitian. Only by pooling the resources of the entire group can adequate control of ulcer patients even be approximated, at least in that group of patients ordinarily encountered in out-patient clinics or hospital wards. In private practice, obviously, a physician must as a rule combine most, if not all, of these skills in himself. In the hurly-burly of urban or metropolitan life, however, the contribution of all these modalities in medicine must be utilized in order to obtain an adequate understanding of the individual and of his practical as well as his emotional problems.

Is the ulcer patient a neurotic? It has already been indicated that he is not in the usual sense of the word. Ulcers recur because of various well-known factors. Obvious indiscretions in diet, excessive smoking, the abuse of alcohol, irregularity in habits, intercurrent infections,—all these contribute to the picture. But in addition, the overall background of anxiety, stress and strain dominates the causes for ulcer recurrences. In civil life these latter factors, if of long duration, undoubtedly exact their toll. Even under normal conditions they are often apparent. Overwork, overanxiety such as

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occurred during the depression, domestic and financial difficulties, all offer sufficient explanation for added tension. Since the outbreak of war still further and even more obvious strains have been encountered. In England, the incidence of ulcer recurrence increased appreciably among the civilian population under the pressure of enemy bombing.

In the armed services, the ulcer problem takes on a somewhat special form although the general principles hold. The first figures from the American and British forces concerned those men in uniform in the induction or training centers. For the most part ulcers were recognized in patients who had a definite history of previous ulcer. In other words, the stress and strain of army life and training, of regimentation, or removal from the protection offered by family, social position, job, and the like, all played an easily recognized part in producing recurrences. Army diet, excessive smoking, abuse of alcohol cannot be forgotten, but the factors already mentioned are of equal or greater importance. In the first years of the war, old ulcers were reactivated and were screened out without too much difficulty. The incidence of recurrent ulcers was somewhere in the vicinity of 90 per cent. Of greater interest, however, is the ulcer story after the men had gone overseas. From recent, unpublished figures it is clear that after embarkation for overseas duty the incidence of new ulcers in patients who were previously well increased considerably. This tremendous increase in acute ulcers in overseas contingents is of particular interest because the new ulcers occurred before the men went into combat. It is probable that few ulcers actually occurred during combat, and this is borne out by statistics gleaned from German medical records during the early years of the war. Few ulcers were noted in the German army during the invasion of Poland but after the campaign was over, possibly because even the Jerries had some remorse and anxiety, many recurrences were observed. Whether many new ulcers developed was not stated. Similar facts can be elicited from reports of our own forces. The anxiety which undoubtedly is present in those behind the lines, due to fear of future death, wounds, crippling, and subsequent failure to support loved ones, or the fear of failure to live up to obligations implied in combat duty, was enough to constitute real and constant anxiety. In the ulcer patient it seems certain that real anxieties, rather than phobias, are the important factors associated with ulcer recurrences or even with the formation of new ulcers. In this connection, it is of interest to note that in thousands of cases of so-called nervous

dyspepsia innumerable neurotics were found, but very few ulcers. In the entire dyspepsia group the incidence of ulcer was only a very small per cent. There are, of course, neurotic individuals who have ulcers also, but they constitute a relatively minor number.

Further differentiation can be made between the ulcer patient and the nervous dyspeptic, and that is in the response to therapy. In the Army, the nervous dyspeptic, who is essentially an inadequate and neurotic individual, responds rather poorly to available treatment except when he is assured of removal from the pressing obligations of army life. On the other hand, the ulcer patient as a rule responds fairly well to simple treatment. The ulcer patient is not generally psychologically over- or hyper-reactive, while the psychoneurotic is typically very reactive, responding to all sorts of stimuli. This was illustrated in studies made by Chapman, Finesinger and Jones on pain thresholds, using the apparatus and methods originated by Wolff and Hardy. In their work differentiation was made between (1) *perception* of cutaneous pain, and (2) *reaction* to it. In the neurotic patient the threshold for perception of pain was found to be within normal limits, or only slightly below them, but the reaction to unpleasant stimulation that caused any discomfort was almost immediate. There was very little spread between perception of and reaction to pain. In ulcer patients, for the most part, the threshold of pain-perception was also at a normal level, but the reaction to pain occurred at a much higher normal level. This was fairly characteristic of the group though it was not invariably so. In an occasional ulcer patient a phenomenon has been noted which is never seen in neurotics. In certain patients with known active ulcers, catastrophes such as perforation or hemorrhage occurred without any perception of a painful sensation at any time. These individuals were tested, and it was surprising to find that first, the actual perception of pain was at a very high level, much higher than most normals, and second, there was an equivalent rise in the threshold for reaction to pain. Actually, in many of this group a burn was produced, subsequently resulting in a necrotic area on the forehead, without the patient being aware of a painful sensation at all.

Prolonged tension and anxiety may well be the factors operative in the activation of ulcer by lowering the general reaction level of autonomic activity in the potential ulcer patient. This is suggested by the work of Chapman, Cobb and Cohen who studied two groups of men in the Service suffering from combat fatigue. Each group was composed

of men of similar ages and body-build who had previously been healthy and robust. Under prolonged, excessive strain one group had broken in a perfectly understandable manner, with resulting symptoms more or less comprised under the term "neurocirculatory asthenia." The second group, although exposed to the identical excessive strain, had not broken and did not complain of symptoms. When tested, both groups showed practically the same threshold for pain-perception. In the first group, however, the reaction to pain was tremendous, and analogous to that seen in the group of neurotics to which reference has been made. In the second group, the reaction to pain occurred only at a very high level, much higher than that of the normal person. Although no absolute analogy can be drawn from this study, it would appear that in a vulnerable group conditions of prolonged emotional tension, anxiety and fear had increased physiologic responses until there was real over-reactivity to any stimulus, including the pain stimulus. It is conceivable that under long continued stress and strain a similar result might occur in the vulnerable ulcer patient, with profound alterations being evident in the vascular, motor and secretory activity of the stomach and duodenum.

In summary, then, the treatment of the ulcer patient includes certain dietary measures, relatively few and simple medications, possibly in the future hormonal control, and in addition real attention to the needs of the individual. This last must include an understanding of the problem, reassurance as

to present anxiety, adequate physical and emotional rest, release from tension either by medication, removal from danger, or from outside influences, and psychological help. Finally must come readjustment to life as a whole. This involves attention to details—work, domestic and personal relationships, and learning the art of avoidance of tension. The last must of course include abstinence from tobacco, coffee and alcohol. From a practical view point, work on night shifts must be avoided. Family worries, financial worries, and the like, must all be taken into account. The patient must learn the trick of breaking the tension during the day by taking an adequate rest period after the noonday meal. The problem is one of education—primarily of the patient, but also of the physician who is treating the patient. In industry, employers must recognize that the ulcer patient is as a rule a useful individual, often more valuable than the average, but that he must be protected against unwarranted states of tension and pressure. In the armed services, the ulcer patient must be removed from positions of extreme and prolonged strain and anxiety; unless he possesses special skill he probably should be separated from the Service.

An attempt has been made to stress some of the important considerations of the ulcer problem—not of the acute phase and its therapy, but of the long-range view of the ulcer *patient*, who is constantly vulnerable to relapses, incident to events he may encounter in every-day life, or more particularly to the vicissitudes arising from military service.

PSYCHIATRIC TREATMENT OF PEPTIC ULCER PATIENTS*

LEON J. SAUL, M.D.

The management of the psychiatric aspects of patients with peptic ulcer rests upon the fundamental principles of clinical medical treatment. These principles are, as we see it, to understand the underlying condition which causes the symptoms, and to do what is necessary in the light of this understanding.

In clinical medicine one focusses not upon the superficial symptom, but upon the underlying condition. In psychiatry, also, one concentrates upon the person himself, and his emotional life—not merely upon his complaints. Only treatment which

is based upon understanding is rational and causal. It is necessary, therefore, before presenting a description of how the psychiatrist manages ulcer patients, and offering suggestions for dealing with them, to review briefly what is known of the psychological causes of the condition. Since only a beginning has been made in unravelling these emotional connections, and since many of you are no doubt familiar with this work, it is perhaps not too rash to essay a survey of the highlights, even in the brief time at our disposal.

The basis of both clinical medicine and psychiatry is biology. The basic fact underlying all manner of emotionally caused symptoms is that we deal with a highly integrated organism, motivated by various

* Read at the New York Regional Meeting of the American Society for Research in Psychomatic Problems, May 11, 1945.

needs and impulses. Our subjective perceptions of these needs and impulses are felt as emotions. Thus the emotions are but one aspect of our biological functioning.

One fundamental biological response is the fight-flight reaction to danger. In his classic book, Cannon (2) described the emergency mobilization of the body under threat of danger—the rise in the blood sugar and the redistribution of blood from viscera to muscles, the inhibition of gastro-intestinal processes, and similar physiological preparations for action. We all know how sensitive the stomach is to all kinds of emotional reactions. The vast majority of men with combat or operational fatigue seen in the Service have stomach symptoms of some sort, ranging from mild epigastric pains to repeated vomiting, ulcers and perforations. Almost any strong emotion influences the stomach, and often the stomach symptoms are central, as they were in a young Marine, who, in a downpour in the dense night of the jungle, with the enemy infiltrating our lines, knifed one of them, only to find in the dawn that it was a member of his own company, which discovery threw him into violent retching.

However, we do not know whether the many kinds of stomach disorders arising from different kinds of emotional tensions lead to ulcers. The relatively small series of peptic ulcer patients who have received thorough-going psychiatric study seems to show that not every prolonged disturbance results in ulcer, but that there is a rather specific correlation with certain emotional needs and situations. The specific condition seems, in the present state of our knowledge, to be the frustration of needs for maternal love—using the term in a broad sense—needs which, in these individuals, take a very specific form (1). In order to take a proper history, and to treat these patients effectively, it is necessary to be familiar with these needs and with the signs of their frustration.

We use the term "maternal love" in a very broad sense to cover these needs for interest, esteem and affection which every one has, and also the needs for relaxation, recreation, emotional support, and help from others, and similar desires which have been expressed in scientific shorthand as "passive-receptive desires." Every one has these needs and desires, although in varying degree and form. Some want their love straight, as direct human interest and affection, in sexual or platonic form. Others crave more sublimated gratifications such as recognition and fame. For some, admiration is the greatest pleasure, and many of these people derive their

greatest sensual satisfaction through the skin,—an observation which is particularly interesting in view of the fact that those given to this pathway of enjoyment seem to have a certain predisposition for skin disorders (3).

Other persons desire human warmth, shelter and protection. Usually it is this that they enjoyed more than anything else in the relationship to their mothers—more, for example, than fondling or the satisfaction of their exhibitionism. For certain reasons, breathing is very important in these satisfactions, and patients of this type are prone to asthma (4).

In still another type of individual, being fed by the mother has been the fountain of greatest pleasure. These people interpret love in terms of the past pleasures which have been associated with all the affection, care and gratification of being nursed and fed by the mother. If they are deprived of this, then their longings for it are often proportionately intensified.

The basic fact is that all their needs for ease, comfort, love, and pleasure are intimately associated with the process of eating and being fed. Their desires thus take a predominantly "oral form." The organism craves love, and this craving is mediated not only by the heart and the endocrines but also by the less romantic stomach. It "waters" not only in anticipation of savory steak, but no less so in anticipation of the delights of being loved and taken care of. Conversely, where the needs for love and care are frustrated, not only the body but the soul finds consolation in the pleasures of the table, the soda fountain and the bar.

The morale of the hospital at which I was stationed would suffer no inconsiderable blow should anything interfere with access to the "hogies" a mile away. The hospital food was quite palatable, but the hogie, or "submarine sandwich," carefully prepared with an entire small loaf of French bread cut horizontally, with its innumerable layers of meats, cheeses, peppers, onions, and other odorous items, is no mere combination of calories and vitamins, but satisfies something deep in the soul of the human biological organism. So inseparable are the biological needs, especially the needs for love and care, from the physiological action of the stomach that these needs stimulate contractions and secretion—activities of the stomach which, when sufficiently intense and prolonged, can lead to ulcer formation, and which can be decreased by treating the needs.

Even if the form and intensity of these emotional needs should prove to be similar in all these cases, yet so variegated are the patterns of human per-

sonality and human life that it is hard to conceive of their ever being treated by rule of thumb. What one must learn is to recognize this common feature—the needs and how they are frustrated—in the very different forms in which it presents itself in the different cases. The treatment will depend upon what one finds. A few cases will illustrate the infinitely diverse ways in which these needs, which have been called “oral-passive-receptive,” are frustrated, with the apparent result of constantly stimulating acid secretion and eventually causing peptic ulcers.

An affable man of middle age, with sorrowful mien, suffered a perforated ulcer in 1944, after only three months of increasing anorexia and post-prandial pain. Supporting his affability, and contrasting with his sad demeanor, he asserted that he had no troubles at all prior to the development of his symptoms. He enjoyed his duties in the Navy and was eager to go to sea.

This line of inquiry proved fruitless so the patient was asked whether he had any other symptoms, whereupon, bit by bit, he gradually communicated the following train of events.

One day while on the way from his station to take his wife to the theater he was delayed on the station, and two or three hours later found himself in his bunk. About a week later, he suffered another similar amnesia, and again came to in his bunk. He hid this disability from his wife but confided in a buddy, and for his own protection never went out about the station without this buddy. His wife, however, quickly saw through the fact that the patient's excuses were flimsy, but began to suspect that these broken appointments were caused by his going out with another woman. A strain appeared in this previously harmonious marriage. Finally, under his wife's insinuations, the patient saw that he had better tell the truth, but now it was too late. His good wife was sure that the amnesias were only another, and rather weird, excuse. The patient brought his buddy as witness, but it was obvious to the wife that the two of them had cooked up the story together.

Her suspicions were further confirmed by the fact that the poor patient, worn down by his fears of having a mental disturbance as well as by the increasing estrangement from his wife, performed his duties only with effort, so that when he arrived home for weekends he was neither in the mood nor physically fit to afford his wife much attention or pleasure, and spent most of his time sleeping and resting in his efforts to keep going. This made it quite obvious to her that he now found his pleasure

during the week with another woman and used his home only as a place to rest up. The more insecure the poor man became the more his wife reacted, and the more was their relationship undermined. Finally, the wife decided to store the furniture.

As the patient felt his marriage drift into jeopardy, he lost his relish for food. Merely looking at a meal was sufficient to satiate him. He began developing post-prandial epigastric pains, and now this decision of his wife caused exacerbation of his symptoms. Finally, his wife did give up the home, store the furniture and take a position, so that the patient no longer had his home as a haven for bed and board. It was at this point that the perforation occurred. By now, the patient's confidence was won and it was easier to obtain the history and to gain some insight into that part of his personality which was related to his gastric symptoms.

His home life had been congenial, but he had been conspicuously close to his mother whom he spontaneously described as a fine cook. The only boy, with two sisters, he was especially favored by his mother. Always a one-woman man, when he married he transferred this devotion toward his mother to his wife. He had never been interested in any other woman, and they had been married for nearly ten years. His occupation involved repeated moves from one location to another. His wife was his constant companion, and each time cooked for him and made a home for him as best she could. Because of this travelling, he was unable to establish any continuous friendships with other persons, and thus became all the more dependent upon his wife.

Not only had he no other close friends but he had very little in the way of social and recreational outlets. Except for a little reading and occasional attendance at church, his life consisted of his work, his travel and his home. He had put all his emotional eggs in one basket, and it was for this reason that the loss of his wife's hitherto complete and unswerving devotion caused such a hungering void in him; and because the patient had no other close human contacts and was unable to indulge in drinking or other escapes, he could find no substitute satisfactions or consolations for this intense frustration of his emotional needs.

It gradually came out that even in peacetime the patient had had difficulty in adjusting to a military organization to which he belonged, and now in the Service, during wartime, although he put up a fine front to himself as well as to others he

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actually was under intense and mounting emotional pressure.

It was explained to him that only persons under severe emotional tension developed amnesic fugues such as his, in which they found themselves somewhere without knowing how they got there. It was when the time came for him to leave his wife and go overseas to an especially hazardous duty that his fugues developed. Very commonly, one finds that a person who is extremely dependent feels inferior because of this, and seeks to overcome it by gestures of independence and heroism. Our patient strove to be patriotic, strong and fierce, but over-reached himself emotionally, and in his fugues, without realizing what he was doing, would run back to bed.

It was now possible to reconstruct the whole sequence of events—the dependence upon his mother, then the dependence upon his wife intensified by the external circumstances, his efforts toward doing the manly thing, the amnesias, his wife's reactions, and his inability to find any substitute or consolation for this loss, the continuing frustration of his deepest emotional need, the concomitant onset of the epigastric pains, and the perforation when divorce was threatened.

The interview just described proceeded in rather typical fashion. First, a discussion of the ulcer history. Then, eliciting the setting in which these symptoms occurred. Next, the family history, revealing some of the development of some of the main tendencies in his personality. Finally, a discussion of the patient's major feelings and motivations.

This particular patient apparently had no important inhibitions in his capacity to receive emotionally. He accepted and enjoyed the love of his mother and then of his wife, and his ulcer developed when this satisfaction was cut off. The therapeutic problem was the restoration of the satisfaction he had lost—in this case, his wife's love—or some substitute for it, should some change of her affections or the exigencies of the military render it impracticable.

The treatment follows naturally from this understanding of the patient's emotional situation. In the first place, through giving him insight into his emotional situation, his own intelligence and his will to get well are enlisted for the solution of the emotional problem which was hitherto not clearly grasped by him. This is usually a powerful therapeutic procedure. It transforms the patient's concept of the symptoms as the mysterious results of incomprehensible neurosis into a conscious grasp

of a real and understandable emotional problem. In the second place, the patient's confidence has been won, and he derives great emotional support from this relationship to a physician who understands him and is obviously trying to help him. In some cases, the patient's reaction to this interest of the physician and the feeling of understanding and security which it provides is dramatic in its effects. Further, the physician can increase the patient's emotional intake by suggesting socially acceptable satisfactions, such as the development of friendships, recreation, and other outlets.

Moreover, in such a case it is possible for the physician to manipulate the environment. The emotional demands upon such a patient as this can be reduced by recommending shore duty for him. At first it seemed that it was indicated to attempt to influence his wife. Perhaps she might have her own reasons for clinging so insistently to her belief in the patient's infidelity. It looked as if the therapeutic result in this case would rest primarily upon the successful treatment of the wife more than of the patient.

This is mentioned to show how flexible one must be in handling emotional problems, and how little it is possible to say that in ulcer cases certain set procedures or techniques are indicated, such as suggestion, catharsis or hypnosis. The ulcer patient represents one outcome of emotional problems, but no two persons are alike and each must be understood individually. The case we have been discussing actually turned out as follows:

After a single interview, with the insight he had gained and the prospects of solution which appeared, the patient brightened tremendously, and the epigastric pains he suffered since the perforation noticeably diminished. The patient returned a week later, wreathed in smiles, and outside sources informed me that for weeks later he maintained an almost continuous beaming grin. He reported that he had explained our entire interview to his wife, including my offer to see her; and she responded with warmth and understanding beyond his hopes. Since that time their relationship had been back on its normal footing, the patient felt like himself again, and his symptoms had all but disappeared. Time alone will tell the duration of this happy result, but whatever the future holds, its theoretical significance is obvious.

In other cases, the frustration is not external and delivered by ironic quirks of Fate, but it is internal and arises from the person's own inability to indulge his own desires. The typical emotional situation is that of the man who has been so trained to

be independent that he resists dependence and receiving from others as weak and shameful. He wants to be dependent, loved and taken care of by others, to receive and take his ease, but he is too ashamed or anxious about these desires to be able to indulge them. Instead, he denies them by emphasizing their opposites. He becomes ambitious and energetic, constantly on the go, taking responsibility, and giving to others. In some men these overcompensatory reactions predominate, while in others the underlying desires show through in frustrated petulance, or in other ways. Sometimes there is a fear of admitting the wishes to be taken care of and loved because of early bitter experience with these longings.

One such man, of gentle, pleasant countenance, had, when a baby, been boarded out by his parents who travelled a great deal. He developed a close attachment to the woman who reared him from infancy, but he could never face his underlying feeling that his own parents had rejected him and wanted to be rid of him, that they thought so little of him that they preferred boarding him out to having their travel encumbered. He felt he must never expect love from anyone, for by so doing he became too vulnerable to a repetition of the terrible pain of rejection. His outlook was dictated by the motto—"Rely only on yourself, expect nothing from anyone, and then you will not expose yourself to rejection and frustration." He thus developed within himself a defense against allowing himself love and indulgence. Thinly veiled by his independence and pleasantness was the underlying frustration and unhappiness.

His ulcer developed in his early twenties, and persisted to the present—twenty-five years later. Apparently it was not influenced by hard work alone, but was clearly correlated with his satisfaction in his job. Like so many ulcer patients he craved activity, which was a defense against, and an escape from, his underlying feelings of frustration, and a support to his self-esteem. But this very need for activity typically drove the person from within and prevented the passive-receptive satisfactions he craved. His ulcer did best when he could be moderately active, but on a job that he liked. When he was made to take it easy by operating an elevator, an occupation in which he was miserable, he developed a hemorrhage.

In such a case as this, it is obvious that insight cannot be imparted to the patient with impunity. The first patient we described could be expected to react to insight as he did, with relief and encouragement, but this man had built up powerful and

lifelong defenses against facing his feelings of rejection by his own parents, and of frustration throughout his life. If then, in middle life, he was forced to see the truth he might well have become seriously depressed, and have been much worse off than if he had kept his ulcer. Efforts could of course have been made to help him accept more freely what was available to him. Support can be given by the physician and he can be helped by environmental manipulation.

Thus, no two cases are the same, and the treatment can be based only upon a firm grasp of the emotional interplay. The first patient could be handled by the practitioner with adequate training in the dynamic psychology of the neuroses and of psychosomatic medicine. The second man could also be handled by him, but only up to the point of the deeper problem. For this man to face the early rejection by his parents, and its profound effects upon his emotional outlook, would require systematic psychiatric therapy, and the relaxation of his defenses would involve a radical alteration in his personality. This is major surgery.

Where such alterations in personality are necessary and indicated, the specialist must be called in. Fortunately, very many cases are not of this type, and can be understood and treated psychiatrically by the conscientious practitioner, if he is especially trained and experienced in this approach.

In many cases, the frustration is caused not by external circumstances or internal inhibitions alone, but by some combination of both. A briefly sketched case will illustrate.

This quiet, friendly officer of 35 was at sea for many months on a ship manned not by the Navy but by a somewhat unusual crew. The officer differed socially and culturally from the crew, and found little in common with them. As the weeks and then months passed, the frustrated emotional needs caused mounting tension in every one. At first, our patient found release in reading, which he had always thoroughly enjoyed, and which transported him from the current frustrations to the vicarious satisfactions of phantasy. Gradually, however, even this lost its effectiveness.

The crew solved the problem in crude but practical fashion by indulgence in wine and women, and even in song, whenever the ship touched port. This was apparently sufficient to relieve the tensions which were built up during the interims. But our officer, faithful to his background and his wife, was unable to forget himself in such carousals. A highly trained professional man, isolated from congenial companionship, cut off by his own

standards from the more primitive indulgences enjoyed by the crew, his frustrations mounted slowly but steadily. Not the man to give in, he stiffened his lip and carried on, but he began to notice increasing epigastric pains. After fourteen months, examination revealed a clear-cut ulcer.

When I saw this man, his reaction was significant and typical of the personality make-up of so many ulcer patients. Here he was, with a well-defined ulcer; he was told there was danger of perforation, and a gastric resection was being considered. Yet, he could not stand the inactivity of the hospital because he did not want it thought that he was, in Navy slang, "fluffing off" and shirking his job. When I spoke to him about the possibility of two or three months sick leave, for a complete rest in his little country place, he said that because of his past training he could never bring himself to ask for anything, and would hesitate even to accept this leave from the Navy. He felt that he should be on the job. He thus expressed clearly and typically the ulcer patient's inability to freely accept his underlying but rejected desires to be passive, receptive and taken care of, and also the compensatory need to be active and giving.

In such a case it is not only necessary to manipulate the environment to relieve the frustration, but these inhibitions of the patient must be thoroughly discussed with him if he is to be emotionally capable of accepting what can be arranged for him. In this case, as in many, pointing out these inhibitions was therapeutically effective. He was shown how this very eagerness to do his job defeated itself, for because of it he was unable to rest in the hospital or even to enjoy a normal vacation, but instead kept his emotions and his stomach in a turmoil, which prevented his ulcer from healing. Getting rid of his false sense of shame at normal receiving and relaxation would facilitate his recovery and his return to his job. Obviously the more deep-seated the inhibitions in such a case, the more difficult the therapeutic task.

Some ulcer patients are very difficult to handle because they present problems which are complex, deep-seated and of long-standing. Also, the patient may be very resistant to revealing his main motivations and feelings. Other patients are the opposite in all respects.

For example, an eminently successful commercial artist developed epigastric pains which led to the x-ray demonstration of an ulcer. He himself had already guessed that it was connected, in part at least, with the price of his success—namely, constant overwork and tension—and the inability to

arrange his life with a satisfactory balance between his energy output and his recreational needs. But the ulcer precipitated him into a step which he had long contemplated. He took his family to a small town in the West, where, with his talent and teaching ability, he had no trouble supporting them, far from the competitive world of the big city. Instead of living to earn, he now earned to live. When I last heard from him, nearly five years later, he was still symptom-free.

DISCUSSION AND SUMMARY

In the light of these cases, it is now feasible to recapitulate and amplify our main points. Let us begin with the interview. Since every person is different, no two interviews will be the same, but certain guiding principles can be followed.

In the first place, we shall concentrate upon the patient himself, and endeavor to discern the major motivations of his life, and his relationships to his main feelings, conflicts and tensions. We shall be especially alert to his needs for love, ease, support, and dependence, and to all those desires which can be considered intaking in nature—*i. e.*, of the same direction as the taking in of food. And we shall watch especially for any frustrations of these desires, whether by external circumstances or by the internal attitudes of the patient himself.

The tempo of the interview is determined predominantly by the patient's personality make-up and by the intensity of his need for help. The physician can rarely force the issue. Rather his effort must be to get the patient to reveal himself. Sometimes, almost all one need do is listen. In other cases, the patient not only resists seeing the pertinent emotional forces, but it may even be dangerous to try to force him to do so.

In the average case it is practicable to begin with a discussion of the physical symptoms. In general, first interviews begin very slowly. As the patient's confidence in the psychiatrist mounts and he feels that there is genuine interest and the possibility of being understood, the pertinent emotional material flows more freely. In general, tactful honesty is the best policy, and special tricks and devices are unnecessary and to be shunned. The discussion of the physical condition usually can be led naturally to the emotional setting in which these began, and, once immersed in this discussion, the patient's deeper feelings usually emerge.

If the patient is too resistant at this point, it is sometimes well to turn to the family background. In the end, one's aim is to elicit the patient's true major motivations and feelings, and how these de-

veloped from the emotional pressures of his childhood, on through to their relationship to his present symptoms. While it is impossible to present a list of the questions to ask, one must keep the patient talking, and bring out his feelings in childhood toward those who reared him, and how they shaped his present personality. One estimates the present emotional interplay and organization from his relationships to his family, friends, work, and recreation. One seeks for positive irritants and hardships, as well as for negative factors such as unsatisfied desires. There is no simple method for comprehending the core of the personality, or for estimating the intensity of the feelings and frustrations. This is a matter of psychological sense and psychiatric experience. It is remarkable how much one often learns by merely listening to the patient, while divesting one's self, so far as possible, of one's knowledge and preconceptions.

Dreams are often invaluable in many cases for penetrating rapidly and accurately to the major emotional forces within the person. It is inadvisable for the physician, inexperienced with dreams, to interpret them to the patient, but with a little interest and study he can often glean simply from the topics of the dreams what is central in the patient's mind: hostility, anxiety, desires for ease and escape, the pressure toward work and accomplishment, needs for superiority, etc. What the dreams tell is usually at least a helpful clue, but more often an invaluable aid, in clarifying one's understanding of the fundamental emotional forces in the case. This understanding is the indispensable basis of rational treatment. In surgery, the cutting is the least. It is the understanding of the pathological physiology and anatomy, and the utilization of the surgical techniques for accomplishing a rational purpose. The analogy between rational psychiatry and surgery is a sound one. Psychiatric techniques, such as suggestion, reassurance, hypnosis, catharsis, and the like, are significant only when one understands the basic emotional situation and applies them rationally for well-defined purposes. Employed without this understanding, they are little more than a medieval laying-on of hands.

We have already mentioned some of the therapeutic elements employed in the ordinary interview. The transference, or relationship to the physician, is always present and can be of great value as a means of emotional support. Neurosis is in essence the persistence of childhood desires and patterns. The patient coming to the physician tends unconsciously

to adopt toward him the dependent, help-seeking attitude of a child to its parent. This gives the physician tremendous influence. This reaction is of great importance in the ulcer patients, in whom we deal so largely with needs to be fed emotionally. Usually it is not necessary to discuss the transference with the patient, but the physician must be constantly aware of it.

Insight, properly used, is effective in the vast majority of cases. Like the interview, it must develop slowly and tactfully, at a tempo set by the patient. But where it can be imparted with reasonable completeness it is a powerful instrument, and makes the entire management much easier for the physician; for now the patient himself understands his problem, will himself have ideas for environmental changes, and will endeavor, in the favorable cases, with real therapeutic urge to alter his attitudes. Some patients, who typically are unable to accept anything freely and must be incessantly striving, can be mellowed noticeably in a very few interviews.

In general, where one cannot relieve the patient through insight, changes in the environment, and relatively simple changes in attitude, one faces major surgery, and it is necessary to call in the analytically-trained psychiatrist. This specialist is also effective for diagnosis and for brief causal treatment, in which he can often save much time. His contribution is *psychiatric accuracy*.

We have only begun to understand the neuroses and their manifestations in all manner of physical symptoms, including gastric disorders and ulcers. The results so far, although insufficient statistically, indicate that with increasing knowledge it will be progressively easier to treat these patients; and even more important, to prevent many ulcers, by relieving the chronic emotional irritation before ulcers form.

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RELATION OF RESENTMENT AND ANGER TO FUNCTIONAL GASTRIC COMPLAINTS

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In recent years, much effort has been directed toward a better understanding of the interrelationship of the psyche and the soma. Such workers in the field of psychosomatic medicine as Jelliffe, Dunbar, Alexander, to mention only a few, have contributed greatly to our knowledge of how the emotions can influence and be influenced by bodily changes. Certain well-defined diseases such as peptic ulcer, bronchial asthma, essential hypertension have been investigated for emotional components with positive results. Somewhat less intensively investigated have been the many rather ill-defined functional conditions, such as headache, back-ache, joint pains, and dyspepsia, for which no definite organic basis has been found and which are quite common in the practice of military neuropsychiatry.

It is the purpose of this paper to present some observations on one such condition, namely, complaints referable to the upper gastro-intestinal tract. Especial attention will be paid to a group of patients who had developed these complaints only since entering military service and an attempt will be made to demonstrate a conscious emotional attitude frequently associated with the onset of such symptoms.

Recently the writer reviewed the histories of 200 consecutive patients admitted to this neuropsychiatric station hospital and his ward for the diagnosis and treatment of minor psychiatric conditions. Most of these patients had been exposed to varying degrees of enemy action, while roughly one-third of them had had to be hospitalized from combat for an incapacitating psychiatric condition. The presenting complaints of these patients were varied, as might be expected. Some complained solely of distressing tension or anxiety, some complained of tension and localized somatic disturbance, while others complained solely of a localized somatic dysfunction.

Of the 200 patients, there were 50 who had as their chief complaint or included in their chief complaints some disturbance of the upper gastro-intestinal tract. This disturbance was verbalized in different ways, *e.g.*, "I always feel sick at my stomach" or "I get pain here (points to epigastrium) every time I eat." In most cases, laboratory and x-ray studies of the gastro-intestinal tract had been made previous to admission to this hospital and

had given normal findings. In the remaining cases, such examinations were made during the stay at this hospital and also revealed normal conditions.

The 150 patients who did not have gastric complaints at the time of admission were composed of 113 who had had no such complaints even in civil life and 37 who did have some gastric dysfunction prior to military service. The 50 patients who now had gastric symptoms were composed of 25 who had had the same trouble in civil life and 25 who had developed this disturbance only after being in the military service. Consequently, interest arose as to what factors in the military service and/or in the patient's personality were responsible for the onset of functional gastric symptoms in individuals previously free of this type of disturbance.

It had been noted during the original psychiatric interview of the latter 25 patients that undisguised and conscious resentment or anger was frequently in evidence. Even the verbalization of the chief complaint sometimes reflected their anger, *e.g.*, "I can't eat a damned thing—everything I eat comes right back up" or "It's my stomach—I've been pushed around from hospital to hospital and they aren't doing a thing for me." There were other less tangible phenomena, such as facial expression and tone of voice, which also indicated a resentful and angry attitude.

More concrete evidence of the relationship of gastric symptoms to this angry attitude were the responses of the 200 patients to the routine question, "Since you've been in the Army, have you frequently felt that you were being pushed around, taken advantage of or treated unfairly?" Affirmative answers were given by 19 (17%) of the 113 patients with no gastric complaints in the past or present, 10 (26%) of the 37 patients with such complaints in the past but not at present, 6 (24%) of the 25 patients with past and present gastric complaints, and, especially to be noted, 12 (48%) of the 25 patients whose gastric symptoms had developed since entering the Army.

Exploration of these affirmative answers yielded such stories as the following: A 20-year-old private, in an overseas replacement depot, complained that his platoon had been unfairly given more work details to do than other platoons. It was at this time that he first began to have epigastric pains when he ate sweets or greasy foods. A 26-year-old

infantry rifleman charged that his particular platoon was given continuously dangerous assignments without relief while the other outfits were getting off easily. It was during this time that he first began to have nausea before and after eating.

Some mention in passing may be made with regard to therapeutic measures used. It was felt that in the treatment of these particular patients especial attention would have to be paid to the angry, resentful mood. It seemed to be based on the feeling that they were being driven on without consideration and that no one had their interests at heart. Care was therefore taken that these patients should not feel that they were being coerced or driven into participating in the ward and hospital Activities Program. An explanation was given them regarding the value of the activities in relieving tension and they were left with the impression that, while the degree of participation was up to them, non-participation would be their own rather than the hospital's or the Army's loss. Opportunity was given them in individual and group therapy sessions to voice their resentful thoughts, the therapist all the while maintaining an understanding, non-retaliatory attitude. Later in the course of their hospitalization the relationship of their gastric complaints to their angry mood was discussed with them.

The following case history is presented to illustrate the factors described:

A 21-year-old T/5 Company Aid soldier was admitted to this hospital in July, 1945. Past history revealed that he was an only child and had lost his father when he was 6 years old. He was quite attached to his mother, who indulged him somewhat. In civil life, he was inclined to be restless, bit his finger nails under stress, but had no gastric complaints. At the original interview he was fidgety and impatient with the questioning. When asked what his main trouble was, he replied with an undertone of disgust and anger, "Everything—I can't eat and I feel like vomiting. I'm a bundle of nerves."

His story was briefly to the effect that he had arrived overseas in September, 1944, assigned to an amphibious tractor unit. For the following nine months he had been on the go almost continuously (in his own words, "They kept driving us on"). He had participated in seven beach landings, the worst of which was the landing on Cebu, where he saw and ministered to soldiers blown up in the mine fields. He found that he was getting nervous and could not eat. During this time he vomited

frequently and lost 25 pounds. His unit went into garrison in early July and he was hospitalized three weeks before transfer to this hospital. During those three weeks he found his complaints becoming worse.

At the end of the interview the nature of this hospital and the value of the activities were explained to him. He was told that further combat would probably not agree with him and that, at the end of his stay here, he would be reclassified to a non-combat unit. But, at this point, he became quite irritable and interrupted the examiner impatiently with, "I don't want reclassification and I don't want to go back to combat—I can't adjust anymore in these damned islands. I've had enough of the Army." The examiner then told him in effect that his feelings and reactions were quite understandable and that after a while he would feel better, especially if he participated in the hospital program.

For the next four or five days the patient maintained a rather sullen and bitter attitude. In a group discussion he remained silent, except for sarcastic asides to another patient, until he finally asked, "How sick does a fellow have to be in order to be sent home? It doesn't make any difference to you how I feel. Every fellow you send back to duty means a feather in your cap." This question was answered in a non-retaliatory manner by pointing out that he, as a Company Aid soldier, must realize the Medical Department's aim of preserving the fighting strength and that his own medical treatment of the members of his unit would never be considered an attempt to get "feathers in his cap."

Gradually his anger left him and his attitude improved as he participated in the occupational and recreational therapy programs. The ward nurse and ward master cooperated in making him feel that he was in a place where people were really interested in his welfare. His nausea disappeared and in two weeks he had gained five pounds. In a final interview, after the patient apologized for "blowing his top" previously, the writer explained how, being under such a strain as he was, it was best for him to get that anger out. The relationship of anger to his gastric symptoms was discussed and then plans for reassignment were talked over. He was discharged to a replacement depot feeling rather cheerful and with no complaints.

* * * *

The effects of a strong emotion on the gastrointestinal tract have long been known. Contracture of the stomach musculature can give rise to symp-

toms of pain, nausea and post-prandial fullness. It has also been known that somatic disturbances are frequently symbolic of the attitudes and thoughts of an individual. In the group of patients described, the gastric symptoms seemed to represent a visceral protest against the pressure and regimentation they sensed in the military service. They appeared to be saying through their symptoms, "I'm fed up" or "You can't cram that down my throat" or "I can't stomach the Army."

This reaction is reminiscent of the feeding problems observed in children who, by means of their stomachs, protest against the pressure from their dominating mothers. In this connection it is interesting to note that in response to the question, "Who was the real boss in your family, your father or your mother," 14 (32%) of the 44 patients with civilian gastric symptoms as contrasted with 11 (11%) of the 96 patients with no civilian gastric complaints gave the mother as the "real boss."¹

The question may be raised as to whether conscious and freely expressed resentment was as frequently found in patients with disturbances of parts of the body other than the upper gastro-intestinal tract. A group comparable to the 25 patients whose gastric complaints had their onset in the Army was a group of 22 patients who complained of headache arising for the first time during some period of their military service. This latter group showed much less open resentment and anger. In response to the previously mentioned question, "Since you've been in the Army, have you frequently felt that you were being pushed around, taken advantage of or treated unfairly?" only 4 (18%) of this group answered in the affirmative as contrasted with 12 (48%) of the group with Army-acquired gastric complaints.

The writer does not wish to imply that resentment or hostility is not also present to some extent

in patients complaining of headache or of symptoms other than gastric. However, the hostility in these patients was not as freely expressed as it was in patients with gastric symptoms. It may well be that the inability to express hostility is responsible for somatic disturbances such as headaches.

While the primary purpose of this paper is to demonstrate the frequent association between acute functional gastric symptoms and the attitude of anger and resentment, a final word may be said in regard to therapy. The group activities and discussion, besides providing other therapeutic benefits, do offer an outlet for the tension arising from anger. In the necessarily and often advisedly non-penetrative therapy of these and other military psychiatric patients, the medical officer usually must deal with the conscious rather than the unconscious attitudes of the patient. The patient can more easily and without untoward reactions be given insight into the relationship between his symptoms and his conscious attitudes than between his symptoms and his unconscious attitudes. It is felt that the giving of this insight, together with exposure to the tonic and cathartic effects of group activities, constitute a therapeutic approach calculated to reduce the symptom-producing tension and resentment of these patients with gastric complaints acquired in the Army.

SUMMARY

A review of the case histories of 200 patients admitted to this hospital for the treatment of minor psychiatric conditions revealed a group of 25 patients who had, as their chief complaint, symptoms referable to the upper gastro-intestinal tract, which symptoms had had their onset during some period of military service. The emotional attitude of this group, as contrasted with that of the other patients, was frequently found to be one of conscious and freely expressed angry resentment. A case report was presented illustrating this emotional attitude and the therapeutic measures used in relieving tension and giving insight.

EDITORIAL NOTE

In his paper on the relation of resentment and anger to functional gastric complaints, Harris reports a statistical correlation between the symptoms and the freedom with which resentment was expressed by these men. This correlation is based upon a relatively small series of 25 patients with gastric symptoms which developed while in service

out of a total series of 200, but the statistics indicate a tendency in the direction of freer expression of resentment in this group. Moreover, more of these patients felt unfairly treated and more of them reported their mothers as the real bosses in their homes than did the controls.

One point of considerable interest in this study

¹ This question was asked of 140 patients coming from homes intact to the age of 13. The percentage giving the father as the "real boss" was the same in both groups, the remaining saying that there was no boss.

is that the correlation is made between the symptom and the patient's conscious, rather than any unconscious, attitudes and that apparently the therapeutic effect was achieved in large part through a discussion of the conscious anger. This raises a number of questions.

In the first place, there is the question of the importance of consciousness of the symptom as compared with the degree of control and repression. That repressed hostility can be responsible for psychosomatic disturbances is fairly well established. Practically all of the papers on headache point to repressed hostility as the critical emotion, although it must be noted in passing that most of this work is not entirely complete or conclusive. Hostility is also thoroughly implicated in essential hypertension and it has been emphasized that its intensity and status are of a special importance. We know that any threat or irritant, external or internal, causes anxiety; and further, as Freud pointed out in his later work, anxiety arises primarily from hostility, is certainly closely associated with it and often is almost indistinguishable clinically. Much remains to be clarified here, but for the present this seems to boil down to the physiological "fight-flight" reaction which is the normal biological response of any organism to any kind of danger or irritation. Hence rarely or never does one see a psychogenic symptom without anger and anxiety being present. The anger and anxiety are thus signs of irritation and it is always a question whether they of themselves exacerbate the symptom, or whether they have little effect on it but are primarily signals of the underlying irritant which is the real cause of the symptom.

Other work on upper gastrointestinal symptoms points to the importance of strong dependent receptive desires, needs for love and care, and a tendency to see the world largely in terms of an oral and a "taking it all in" attitude. When such a person feels well he tends to have a large appetite and as soon as he is unhappy he tends to reject the world in the form of anorexia, nausea, and even vomiting. The usual source of this tendency in the suckling desires of the infant toward the mother is, no doubt, what leads the author to his question of whether the mother or the father is boss in the family and to his finding the trend toward the mother being the dominant figure in these gastric cases. The importance of this "oral dependent" need was further confirmed by the first two patients mentioned, who complained that other outfits were better treated than theirs, which is a common manifestation of sibling rivalry for

mother-love and care. Thus, being well treated, and whether others were better treated, was the central emotional issue rather than, for example, such other reactions as rebellion against authority, hurt prestige, envy of officers, etc. The importance of this oral trend also raises the question as to whether the gratification provided by the hospital did not strongly contribute to the therapeutic effect, it being emphasized that the ward nurse and the ward master cooperated to make the patient feel "that he was in a place where people were really interested in his welfare," as well as the prospect of release from the demands of combat duty.

If the frustration of dependent receptive wishes is truly correlated with symptoms in the upper gastrointestinal tract, then anger—the inevitable result of frustration—must also always be present to some degree. This paper raises a question of the effect of the anger on the symptom and also, if the statistics are corroborated by a larger series, why it should be freer in these cases.

In regard to dealing with patients' conscious attitudes, it is worth noting that with sufficient experience it is usually possible to deal very directly with unconscious motivations, even in a single hour, in the military setting, but removed from the front lines when men are under severe external pressures. Moreover, usually only certain parts of the patients' attitudes are fully unconscious. More often the man knows that he has certain demands. What he is not conscious of is their intensity, their connection with his symptoms, often their importance in his interpersonal relationship, their influence upon his emotional life, etc., but he is conscious, for example, of his expectations and this provides an opening wedge. It is so, too, with the anger. Although in some cases it is thoroughly repressed, in most the person is conscious of resentment although he may not realize its depth and strength nor its sources and effects. But here again, beginning with that which is conscious, one can often penetrate in a single hour to significant connections which greatly relieve the individual. This was the rule during the war when most of the cases were reactive to enormous external stresses. It does not, of course, hold in the more chronic cases seen in civilian life although, with increasing knowledge of emotional interrelationships and consequently increasing accuracy of interpretation, not only will brief psychotherapeutic methods become more effective but even classical psychoanalysis can be expected to be a much briefer procedure. Certainly in the military service, where the external stresses are great, one must understand the major trends

in a man's personality and then the effect of the specific stresses of the service upon him; and for anything like a complete picture, the observer must penetrate to the patient's major emotions and motivations, whatever these may be and regardless

of whether the man is partly conscious of them or not. Meanwhile, these correlations with conscious attitudes are of considerable interest and raise stimulating questions.

LEON SAUL, M.D.

THE HARROWER STRESS TOLERANCE TEST

F. R. C. CHALKE, CAPT., R.C.A.M.C.*

BACKGROUND OF THE EXPERIMENT

At the cessation of the war in Europe, it was considered likely that large numbers of Canadian troops would be transferred to the Pacific theatre. Consideration was given to the possibility that these troops would be required to pass a psychiatric screen prior to redeployment. Various psychological tests to be used in this screening were under appraisal, among them the Harrower Stress Tolerance Test. Since the test was, as yet, unpublished and in the course of development, it was thought advisable to carry out a validation experiment.

METHOD

The technique used was that outlined by Harrower in a personal communication and is the same as that given by Harrower and Grinker in their article.¹ However instead of ten, only four of the battle scenes were used as a traumatic stimulus—these were:

Original scene (3)

"Two planes have crashed on very barren terrain beyond which blue sea is visible. From the place, in the background, arises a huge column of fire and smoke. Three figures in grotesque, helpless positions are lying around the plane in the foreground. From the cockpit of the plane the head and arm of a fourth are also visible.

Original scene (4)

"In the foreground of this picture are three human figures. A child and a man lie dead on the ground. An axe which has fallen from the man's hand is beside him. A woman stands over them with wild eyes, a look of horror on her face. Behind them, forming a continuous line against the

sky, are columns of flame, burning homesteads. In the sky four planes are visible.

Original Scene (5)

"In the foreground of this picture is a cross. Three brutal-looking men are driving a spear into the side of a crucified figure. These men are dressed in the uniforms of the German and Japanese and flags of the Swastika and Rising Sun are held by other figures behind them. At the same time, from the air, a plane is directing its gunfire at the crucified figure so that the fiery bullets also converge on the same point that the spear is hitting. A column of fire is rising against the dark blue sky. A broken cross stands on either side of the crucified figure.

Original scene (9)

"In the foreground on a rock and beside twisted barbed wire lies a dead soldier with arms outstretched wildly. An unattached head of a second figure and an arm are beside it. Behind him, across a stretch of water, a huge battleship is blazing."¹

The five slides (2, 6, 7, 9, and 10) of the standard Rorschach Series were shown before the stimulus in all cases. The stimulus was followed by the corresponding five slides of the Harrower Series. The effect of using the converse arrangement was not determined.

The measure of deterioration between the first and second ink blot series was based entirely on the objective evidence of failure to give a response to as many slides in the second series as were given in the first series.

RESULTS

The following three groups were tested:

(a) Twenty-three officer candidates undergoing appraisal at an Officer Selection Camp.

(b) Six soldiers hospitalized for psychosis (five schizophrenics, one hypomanic).

* This work was carried out as a project under the Associate Committee for Army Medical Research of the National Research Council of Canada.

¹ Harrower, M. R., and Grinker, Roy R.: The stress tolerance test. Preliminary experiments with a new projective technique. *Psychosom. Med.*, 8:3, 1946.

(c) Eighteen soldiers under care in a neurosis treatment centre.

Group	No. of records reflecting disturbance of second record by "battle stimuli"	No. of records showing no disturbance in second record "battle stimuli"	Total
A. Officer candidates (controls)	1 (4%)	22 (96%)	23
B. Psychotics	0 (0%)	6 (100%)	6
C. Psychoneurotics	11 (61%)	7 (39%)	18

The psychoneurotic group (C, above) was divided into two subgroups on the basis of the history. The first group included men who had not been in action or whose neurotic breakdown did not appear from the history to be causally related to warfare. The second group were those who dated their symptoms from action or whose chief symptoms suggested an etiological relationship to battle (battle dreams, guilt or depression over battle experiences, etc.). When this was done it presented an interesting result.

Group	No. of records showing disturbance of second record following "battle stimuli"	No. of records showing no disturbance in second record following "battle stimuli"	Total
"Non-battle" cases of psychoneurosis	2 (25%)	6 (75%)	8
Battle cases	9 (90%)	1 (10%)	10

The control group (officer candidates), psychotic and non-battle psychoneurotic patients, totalling 37 subjects, show only 3 "positives" (8%). Of the 10 battle neurotics 9 out of 10 (90%) gave positive results.

In other words, with the test used as a screen for the total group of 47 subjects, it would select 9 of the 10 susceptible subjects with only 3 false positives.

Several incidental findings are of interest:

(1) The one officer candidate who showed failures on the test was among those rejected as an officer because of personality inadequacies. (The board was not aware of the test results).

(2) Though 2 out of the 8 non-battle neurotics showed increased failures on the second record, a similar number showed more failures on the pre-stimulus record than the Harrower Series. This did not occur in any case in other groups.

(3) One "battle case" became severely disturbed

during the battle scenes, tore up his test booklet and banged out of the room. This case is not included among those summarized above.

DISCUSSION

The results obtained in this experiment tend to confirm the findings of its originators. Harrower and Grinker applied the test to a group of normal controls and a group of battle-fatigued airmen. We have gone a step further by testing a group of psychoneurotics, many of whom have similar clinical syndromes, and demonstrated its value in selecting those with a specific exciting cause. It is in this field that the test's most useful purpose might be served in Military Psychology.

The preliminary nature of this work makes predictions as to other uses in the field of applied psychology premature. One variation of the test might be to substitute disturbing scenes related to dangerous occupations in testing for recovery in fatigued workers or in employee selection.

In abnormal psychology the test has many possibilities. Patients suffering from similar psychiatric syndromes might be tested, by substituting various types of disturbing stimuli, to determine the presence of constant stressful situations characteristic of the syndrome. Moreover, with expert Rorschach interpretation the comparison of records would determine the pattern of the reaction to stress, characteristic of the particular personality.

The result of this experiment suggests that critical studies should be made on the Rorschach Test itself as an indicator of "basic" personality structure. Harrower and Grinker pointed out its susceptibility to variation by means of superficial external stimuli. Our results confirm this finding. Further study should be carried out on the effects of test setting and immediately antecedent episodes on the Rorschach Pattern.

SUMMARY

Validation experiments have been carried out with the Harrower Stress Tolerance Test, which indicate its value in screening persons susceptible to specific, disturbing situations. Differentiation not only between "normals" and "neurotics" is noted, but also between cases presenting similar clinical pictures but of apparently differing etiology.

REVIEWS OF PERIODICAL LITERATURE

HALSTED, JAMES A., AND WEINBERG, HARRY: *Peptic Ulcer Among Soldiers in the Mediterranean Theater of Operations*. New Engl. J. Med., 234: 313, 1945.

Due to screening at the induction centers, peptic ulcer was not very frequent in the Mediterranean theater of operations. The Sixth General Hospital in North Africa, however, presented an opportunity to study an unusually large number of patients with this disorder because many patients were sent there before evacuation to the United States. Data were collected on 200 unselected consecutive cases among enlisted men. The purely clinical aspects and the psychosomatic features were investigated. Certain data have been obtained about the nervous tension of army life as a factor in either the aetiology or in the course of the disease. In addition, personality differences were observed between patients with peptic ulcer and those with chronic psychogenic dyspepsia.

From x-ray studies, the ratio between ulcer and dyspepsia was estimated as 1:3. There were 200 established ulcers in the series. This high ratio is explained by the fact that a considerable number of all ulcer patients of the theater were sent to the hospital.

For the study a very careful history was taken of each patient with special stress on all factors that might have a bearing on the psychic side in the aetiology or course of the disease. The usual laboratory studies and x-ray were done to establish the clinical status of the patients.

The two entities could be differentiated by the way the patients described their symptomatology. The dyspepsia group was very verbose and it was felt that their symptomatology was a direct expression of their anxiety. The ulcer patients hardly volunteered any information and were more stoical and unconcerned. In 72% of the ulcer patients a typical symptomatology was found. Forty-four per cent had a family history of dyspepsia. X-ray showed a crater in 48%. It was found that the peptic ulcer patients generally corresponded much better to the relatively simple dietary measures than the dyspepsia patients. From the statistics collected it could be seen that nervous tension and increase of anxiety had a definite influence on aggravation of the disease.

Among combat troops there was an incidence of 3.4% of ulcers in cases of chronic dyspepsia. This is regarded as strong evidence that combat is not an important factor in the cause of the disease. More new ulcers developed among the base troops than among the combat troops, which would suggest that "frustration of regimentation with frequent periods of inactivity would be more damaging than actual danger in which there are opportunities for release of energy

through aggressive action." In many patients with psychogenic dyspepsia there was no apparent anxiety. In ulcer patients two important features revealing emotional insecurity could be found. There was high incidence of unfavorable childhood environment and a high divorce rate among the married men. There was frequency of childhood enuresis, anxiety phobias, drinking, and mild or moderate psychosexual disorders. Despite this, only 5% manifested a clinical neurosis.

The ulcer patient seems to solve his underlying insecurity by developing an abnormal drive, combined with restlessness and impatience, by which he controls his anxiety. The dyspepsia patient magnifies his disease and is overcome by it. Since the personality types of ulcer and dyspepsia are different, it appears illogical to assume that the latter develops into ulcer. This would explain why in combat troops, where dyspepsia of psychogenic origin is extremely frequent, ulcers are encountered so rarely. (O.P.)

GARMA, ANGEL: *Psychogenesis of Peptic Ulcer*. Rev. de Psicoanalisis, 2:602, 1945.

Four patients with peptic ulcer were analyzed by the author; two of them were physicians, one was a lawyer and one an architect. Only the common personality traits are discussed. In all patients could be found the traits typical for ulcer patients, according to Alexander's investigation.

In two patients the dominant rôle of the mother was quite obvious, but in the others there was a strong family attachment with strong leaning of the son towards the mother, disturbing free personality development. The conflicts began when the children, a few years old, would have normally established the first social contacts outside of the family. A strong fixation towards the mother or other members of the family developed, bringing about an infantile inactivity that persisted as a character trait for life. Later on there was compensatory tendency towards overactivity, leading sometimes to success and at other times to failure. This served to satisfy the ambivalence about activity-passivity.

Submission to the mother used to be found in homosexuality, and in ulcer sufferers it may find secondary elaborations as in paranoid ideas. One of the patients of this series was an overt homosexual.

At the approach of adult age the conflict about activity-passivity becomes more pronounced. There is overactivity on one hand and a wish to be taken care of, as in infancy, on the other hand. There is an unconscious desire to be fed as in early infancy and the unsatisfied desire leads to gastric hyperfunction with secondary ulcer formation under organic influences (Alexander). Here the author's view differs from

Alexander's. In his opinion the ulcer is not a secondary organic lesion alone, but has a direct psychic meaning. He compares it to the stigmata in hysteria, the influence being exerted over the trophic nerves. The patients, because of their oral motor fixation, try subconsciously to resolve the difficulties arising from the conflict of latent passivity—overt overactivity, like digesting a difficult food. This is expressed in many phrases of every-day language. It gives rise to all the signs of overactivity in the digestive tract. The patients frequently overcome external difficulty with their energy, and may have gastric spasms at the height of the external conflict. In this connection it is interesting that among bomber crews in combat as high as 15% may develop ulcers. These observations were all described by Alexander.

In analysis it is found that these patients exteriorize an intensive oral aggressivity developed from the infantile frustrations because of the enforced renunciation of extrafamilial environment necessary for the normal development. The oral aggressive tendencies cannot be satisfied and are rejected by the environment. Soon guilt feelings appear and cause a turning of the aggression against themselves as a self-punishment. This is even expressed in the word "mordidura," meaning the conscience is biting (Gewissensbisse).

This is not merely a metaphor, because the patient is unconsciously acting out his self-aggression by way of the trophic nerves. The aggression of the ulcer patient against himself comes not only from his repressed sadistic tendencies but also from the enforced acceptance of external aggressions. During the first period of life the digestive tract maintains the main contact of the child with the mother. Therefore so often at that time conflicts with the mother take the appearance of digestive conflicts. And in later life the same pattern may be repeated for other conflicts.

The separation from the mother is painful to subjects with an infantile fixation to her. One of the author's patients compared the ulcer to the wound of separation at birth. In one patient the ulcer appeared when his wife had a child. This trauma was intensified by the following reduction of his wife's attention towards him because of the child. She was for him a mother-substitute and the reaction was so intense that he went, for a time, back to the town where his mother lived.

External trauma, too, acts in the same sense because external, cruel force caused the first painful separation, and every time new external difficulties come up they represent a repetition of this painful experience.

The difficulty in the ulcer patient is that, with a repetition compulsion, he will seek circumstances that favor the development and the reactivation of ulcers. This can only be resolved by intensive psychotherapy, which, therefore, is of the utmost importance in the treatment of ulcer. (O. P.)

SHER, N.: *Causes of Delayed Menstruation and Its Treatment. An Investigation in the Women's Auxiliary Air Forces.* Brit. Med. J. 1:347, 1946.

Teebken, reviewing the findings of the last war, found that, in 1917, 5.11% of the gynecological patients suffered from "Kriegsamenorrhoe." The duration was between two and twenty-four months. As aetiological factors he thinks of: (1) deficiency of first class protein; (2) psychical factors; and (3) increased work. Among the patients of the present investigation the highest percentage was contributed by those with sedentary occupations. The protein content of the diets in the Royal Air Force stations was found to be sufficient to warrant the conclusion that protein deficiency is not an essential factor in delayed menstruation. Carbaminocholine chloride in the amount of 0.001 to 0.002 Gr. t. i. d. was given for treatment. This is a powerful parasympathomimetic drug and its use was suggested by the favorable reports about the use of prostigmine. Controls were treated with placebos, and when no menstruation started, were continued on the drug. Seven of nine responded well. In one case the patient was depressed and the interview, partly in the nature of a psychiatric examination, may have helped to adjust the patient better and thus to facilitate the onset of the menses. The following experimental evidence is available from the attempt to explain the cessation of the bleeding period:

(1) The hypothalamus probably governs our emotional response to external environment, that response being expressed through the hypothalamic, sympathetic and parasympathetic nervous system connections (Masserman, 1941; Tucker, 1941).

(2) Hypothalamic stimulation produces autonomic discharge, the final effect being dependent on the preponderance of the sympathetic or parasympathetic nervous fibers (Gellhorn, 1941).

(3) The injection of oestrone in ovariectomized animals causes a hyperaemia of the uterus and an increase in its acetylcholine content. Bleeding may depend on the presence of the latter (Reynolds, 1939).

(4) Luteinizing hormone is released from the anterior hypophysis by an acetylcholine-like substance, liberated by the hypothalamus (Taubenhaus and Soskin, 1941).

One can see that environmental stress or psychic trauma, no matter what its origin, will activate the hypothalamus to produce adrenaline and acetylcholine. If the sympathetic fibres predominate, acetylcholine will be relatively deficient. Bleeding will be stopped either because of local deficiency of acetylcholine in the uterus or because of absence of luteal hormone and consequently of corpora lutea. The individual differences among patients may ultimately be an expression of character and probably depends on the degree of representation of the sympathetic and parasympathetic nervous system in the cortex.

"The belief that the pituitary gland is the 'leader

of the endocrine orchestra' is perhaps not now entirely true, and it may, in fact, play 'second fiddle' to the hypothalamus." (O. P.)

Psychogenic Rheumatism. Current Comment. Med. J. Australia, 32:439, 1945.

Objection is made to indiscriminate use of the term "psychogenic rheumatism" as, for example, in a recent report by Boland and Corr on a study of 450 cases, in which they apply the term to "states in which symptoms such as pain, stiffness, subjective sense of swelling, or limitation of motion in the muscles or joints are caused, intensified or perpetuated by mental influences." The term rheumatism appears to be applied in too wide a sense, almost as if by the latii.

J. L. Halliday examined the question of psychic influences in his article, "Psychological Factors in Rheumatic Disease." He states that medical training neglects to educate the student to look for the psychic aspects of disease in favor of the organic aspect. He states three questions important in the search for etiology: "What kind of a person is this?" "Why of all the days and weeks of his life did he begin to take ill when he did?" "Why did he take ill in the manner he did?"

J. Flint and H. S. Barber report their findings in a paper, "The Psychogenic Basis of Some So-Called Rheumatic Pains." They saw in an Army Air Force center for rheumatic diseases 120 patients with related disturbances. Among them was a group of 42 patients with no physical findings, with generalized bodily pain as the chief symptom. Their condition was entirely a psychogenic reaction, but their previous diagnosis included fibrositis, subacute rheumatism, myositis, and multiple joint pains. In them many features were found that point to psychogenic factors in the etiology. Special reference is made to the importance attached by Kretschmer to the will to get well (Gesundheitswille).

Hysterical reactions were present in 17 patients in one of the following forms: (a) reappearance in hysterical form of what might have been a former organic rheumatic condition; (b) hysterical prolongation of what was possibly a former rheumatic condition; (c) hysterical complication of an underlying mental disorder. The authors thought that in the series a psychogenic reaction had not been considered often enough as time went on and the response to treatment was disappointing.

In conclusion it is stated that our present knowledge still warrants a critical attitude to the question of psychogenesis in the etiology of rheumatism and that much will have to be learned. (O. P.)

NAIDE, MEYER, AND SAYEN, ANN: *Venospasm. Its Part in Producing the Clinical Picture of Raynaud's Disease. Archives Int. Med.*, 77:16, 1946.

The following observation was made on a patient, a white man of 26 years, who was given previously

the diagnosis of Raynaud's disease and cold allergy. On exposure to cold he experienced swelling and cyanosis of the hands and face. A basal vascular tone test revealed a low arterial tone, and it was observed that on exposure to cold the veins became invisible and the hands began to swell and to become cyanotic. These phenomena could not be explained by arterial spasm and it occurred to the authors that they are due to venospasm. Further study of the patient led to the realization that the cyanosis and swelling were similar to changes observed in some patients with Raynaud's disease. In some, cyanosis and swelling took place before the blanching, in others the pain was associated only with the period of relaxation of the arterial spasm. Here, apparently, the veins relaxed after the arteries, which led to congestion. The venous walls are richly supplied with sympathetic fibers and their smooth muscles react to nervous stimuli in the same way as those of the arteries. In 10 patients with Raynaud's disease in only one arterial spasm alone was found. Eight showed arterial and venospasm, and in one venospasm only was found. It is proposed to differentiate the types of Raynaud's disease (primary—no obvious cause) and Raynaud's phenomenon (secondary—due to other conditions) according to the relative involvement of both arteries and veins in the vascular spasms.

Anatomically there is often found an imbalance between the caliber of the arteries and veins in the hand. In patients with thin veins sympathectomy may relieve the blanching but the cyanosis may persist.

Cold and emotional factors are the important etiologic factors in constriction of the vessels of the hand. Cold can easily be prevented, but the nervous tension, almost always present in these patients, is often not given due consideration. As Mufson states, in some patients attacks can only be prevented by removal of the psychic causes and the nervous tension. Prohibition of tobacco, hygienic and dietary measures, of course, should be included in the program of management. If the BMR is even slightly reduced, thyroid will be of value. Estrogens will be of advantage if the disease appears during the menopause.

"The term 'Raynaud's phenomenon' should be reserved for digital vasospasm secondary to other known pathologic conditions. Conditions in which secondary digital vascular spasm occurs include scleroderma, cervical rib, scalenus anticus syndrome, pneumatic hammer disease, arthritis, various neurologic diseases, pressure from a crutch, causalgia, and probably other diseases." (O. P.)

FRIEDMAN, A. P., AND BRENNER, C.: *Principles in the Treatment of Chronic Headache. N. Y. State J. Med.*, 45:1969, 1945.

Among the many very dissimilar causes of headaches, migraine, psychogenic and post-traumatic headache are discussed. A recent study showed the importance of psychogenic factors in post-traumatic headache. Its

incidence was high in patients with symptoms of marked immediate emotional reaction to the injury and in those with complicating environmental factors. It was less in patients with a very mild head injury and in those who were injured while playing. A similar two fold aetiology is frequently demonstrable in migraine, as in the following case: G. Z., male, attorney, 32 years old, suffered from migraine since his graduation. Ergotamin tartrate was only partially successful in controlling the attacks. The attacks occurred most often in the evening before the patient had to appear in court. After a period of psychotherapy the attacks were relieved in number and intensity and could then always be relieved by ergotamine tartrate.

"The fact that bodily changes can be brought about by emotional stimuli just as effectively as by bacterial toxins or trauma is well known, but how is one to make use of this fact in the approach to the problem of the treatment of the headache? The method of history-taking is of the utmost importance. Both the subject organization, which gives a cross-section of the patient's present difficulty, and the personality organization, which gives a longitudinal section of the life of the patient, are necessary parts of the examination of a patient with headache. An attempt is made to determine what are the factors in the personality and environment which precipitate the headaches and the dynamics involved. In some cases they may be quite simple but in others it is very difficult, because there may be repressed material of which the patient is unaware." (O. P.)

MORALES, LOUIS M.: *Treatment of Anxiety*. Boletín de la As. Med. de Puerto Rico, 27:471, 1945.

Anxiety is pathological when it is out of proportion to the provoking stimulus, when it is prolonged, or when it appears or persists without an external causative factor. It is an emotional phenomenon and as such involves the whole organism, like all affect states. This "all over reaction," although a psychic phenomenon, has many physical causes. Although their physiological repercussions may be the same, anxiety and fear are not to be confused. Fear is a natural reaction to danger, but pathological anxiety is a neurotic symptom originating in the unconscious of the individual.

Anxiety is a general symptom in all morbose mental states, and, to make general statements about it is like discussing fever and its treatment in inflammation. But just as we learn about febrifuges and apply our general knowledge judiciously in treatment of disease, we should know about how to deal with anxiety states in order to be able to help the sick individual. If we see an anxiety sufferer and unprejudicedly look at him, we will find that his suffering is often much more painful than that from organic diseases. Physicians can be divided into three groups in regard to their attitude in these cases: (1) Hostility, because of

ignorance; (2) neurotic identification, with display of anxiety by the physician himself; (3) understanding and effective help.

The dynamics of anxiety are discussed briefly and the rôle of subconscious conflicts in its formation is pointed out. In the author's experience these are frequent situations: A mother about to lose the son to a daughter-in-law; an aging wife, helplessly watching her husband's gradual estrangement; a daughter of a tyrannical father, hiding her love affairs from him; a wife hiding hers from her husband; an adolescent being very jealous of a sibling he thinks preferred by the parents. The general practitioner can do much to alleviate the suffering of those patients without being a psychiatrist. He needs a clear understanding of the situation and must be sure of the diagnosis. In addition, he needs a good measure of patience and good will.

Sedatives and antispasmodics are used only to give the patient temporary relief from his somatic symptoms, and this must be explained to him. Psychotherapy is the main treatment and should help the patient to understand clearly his vital problems. He should see the connections between his conflicts and his anxiety as well as his psychosomatic symptoms. He should be helped to make judicious decisions for the solution of the conflicts.

The means to achieve this are: establishing a good rapport, making the patient confident and feeling a personal liking for his physician. He should see in the physician a competent and understanding friend. By giving the patient moral support, the patient will subconsciously identify himself with the physician's moral fortitude. If possible, the subconscious material should be brought to the surface. The deceiving rationalizations of the patient should be exposed and he should become aware of his true sentiments towards himself and his environments. He should be desensitized against the traumata that caused his anxiety, by repeating their discussion and showing him how at one time they might have had more importance, for example in childhood, but how they are much less or not at all important or serious at present and how he is over-reacting to them. Reeducation plays an important part. The patient should also be stimulated in his desire to react to his conflicts on an adult level. Many physicians with intuition help their patients without having any knowledge of the scientific basis of psychotherapy. But "How much more efficient and satisfactory would be their work if they knew exactly what it is they are doing when using those techniques." (O. P.)

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BOOK REVIEWS

TEMKIN, OWSEI: *The Falling Sickness. A History of Epilepsy from the Greeks to the Beginnings of Modern Neurology*. Baltimore, The Johns Hopkins Press, 1945, 379 pp. \$4.00.

This book is scholarly and is most rewarding reading. The falling sickness was the subject of one of the Hippocratic books and received at least passing comment from practically all subsequent great medical writers. Because of the biblical story of the casting out of devils, it was a subject of patristic discussion. It had applied to it, for explanatory purposes, all the medical theories, superstitious and rational, that flourished from early Greek days through the subsequent centuries of medical history. Finally, in the middle of the last century, came Hughlings Jackson, Charcot, and what Professor Temkin calls the end of the falling sickness.

The book teaches more than the historical facts about epilepsy. It provides profound documentation for a study of the human intelligence faced with a baffling problem. No less interesting than the observations and rational thoughts of the medical men were the fantasies bred in them by the contemplation of the epileptic symptoms. The Hippocratic writer was a rationalist: he said that epilepsy, or the falling sickness, was not a "sacred" disease, but due to natural causes. Galen, too, wrote that it had a natural basis, a phlegmatic congestion of the brain ventricles. But in classic times there were probably others who preferred supernatural etiologies and, with the coming of the Dark Ages, the demonologic interpretations dominated. Galenic naturalism was swamped by the social popular movement that produced Christianity. Theory and therapy became a matter of demons, charms and witches' brews.

The Enlightenment is credited with having swept out the Dreckapothek and with relegating the supernatural theories from medicine. Yet it is a little hard to be too enthusiastic about the Enlightenment. It still utilized the falling sickness as a convenient screen on which to project the unconscious fears and fantasies

of doctors, even if it concealed these under the cloak of a straight-face rationalization. The naive fantasies were supplanted by pseudo-scientific rationalizations, hardly to be preferred to the frank demonology. Thus Tissot (1750) attributed the causation of epilepsy and most other nervous disorders to masturbation; and several eminent practitioners consistently advised and performed castrations.

Professor Temkin's forerunner as a medical historian, Calmeil, by recording and interpreting the history of madness from the time of the Greeks to the Renaissance, probably did as useful a job as anyone in bringing clarity into the literature on the falling sickness. The early nineteenth century was particularly interested in the psychiatric aspect of the convulsive illnesses.

The introduction of bromide into the therapy of epilepsy, due as the author says "to a rather doubtful theoretical concept," provides us with an interesting insight on the working of unconscious fantasies in pharmacology. When a German writer found that bromides produce temporary impotence in men, Locock was introduced to try it on hysterical women and then on "hystero-epilepsy" and epilepsy. It worked, and due to the clinical trial made by Wilks and his report in 1859, it became the most popular drug in epileptic therapy.

To Jackson and Charcot, who "ended" the falling sickness, Professor Temkin devotes an illuminating last chapter, which brings the history down to the middle of the nineteenth century. Jackson acquired his evolutionary theories of nervous function from a study of Bain and Herbert Spencer. The theories were, however, entirely consonant with the best laboratory physiology of the brain at the time and were widely accepted. Charcot's work on the hysterical is portrayed as a companion-piece and complementation of Jackson's labors.

The bibliography contains 706 references and there is an excellent index.

BERTRAM D. LEWIN

MEAKINS, JONATHAN C.: *The Practice of Medicine*. Fourth Edition. St. Louis, C. V. Mosby Co., 1944, 1393 pp. \$10.00.

This is a text book of the same general group as Osler, Cecil, etc., designed for a systematic review of medicine by the student in the medical college and for quick reference by the practitioner. It is an excellent representative of this group. It is written with simplicity, clarity and good organization. The illustrations are both generous and good.

The book suffers from certain deficiencies. The bibliography is badly out of date. There are a number of inaccurate descriptions of diseases which careful check might have eliminated. Like all texts these days, the chemotherapy of certain diseases is out of date by the time the book is published.

The introduction comments on the rapid increase in awareness and knowledge of the psychosomatic aspects of medicine. However, the accounts are uneven in value because different sections of the book have been written by different clinicians. The account of neurocirculatory asthenia is comparatively excellent; the descriptions of peptic ulcer and migraine are relatively poor.

The section on mental illnesses is unforgivably inadequate. The space devoted to the psychoneuroses and other mental illnesses totals 7 pages, although 13 pages are devoted to the subject of cyanosis. When one remembers that most practitioners encounter the one group of diseases many times daily and the other relatively infrequently, the disproportion becomes grotesque.

It is to be hoped that this deservedly popular, widely read and influential book will devote much more attention to psychosomatic medicine in its later editions; not only in special sections, but throughout the text.

MACK LIPKIN

BRAIN, W. RUSSELL, AND STRAUSS, E. B.: *Recent Advances in Neurology and Neuropsychiatry*. Philadelphia, The Blakiston Co., 1945, 363 pp. \$5.00.

In the preface to this compact volume, the fifth edition in the series since 1929, the authors celebrate their renewed collaboration (after a temporary desertion by Strauss during the fourth of the series) in the following statement: "There is still room for neurologists, psychiatrists and psychotherapists; but all should be neuropsychiatrists . . . and, of course, . . . competent general physicians." No one can cavil at this dictum, yet it reveals a covert assumption, reflected throughout the book, that since the "mind" after all resides in the brain or nervous system, psychiatry can therefore be scientific only insofar as it is reducible to neurophysiologic terms. In conformity with this thesis the authors have written an excellent review of recent developments in the field of neurology. In fact, the chapters on headache, brain tumors, electroencephalography, the hypothalamus, and the neural avitaminoses are outstanding examples of brevity, directness and clarity of style—qualities in which our British colleagues so often surpass our own medical

writing. And although American and continental contributions are sometimes neglected, we cannot begrudge the special recognition this volume gives to the work of outstanding British investigators, such as Walshe in cortical function, or W. Grey Walter in electroencephalographic technique.

Unfortunately, the volume cannot be as highly recommended for its presentation of recent developments in psychiatry. Its pages are bare of any discussion of theoretic evolutions in this field; nor, from the clinical side, is there adequate recognition of progress in experimental psychology, psychosomatic medicine or—almost unbelievably—in the fertile reaches of war psychiatry. The only "advances" specifically discussed under psychiatric treatment are leucotomy and electric shock therapy, but here again the predominantly neurologic orientations of the volume come into play. Thus, on page 129 it is inferred that leucotomy relieves the patient of emotional difficulties by severing pathways to the diencephalon, inasmuch as "frontal lobe centers have a supporting effect upon activities of the emotional centers in the thalamus and hypothalamus." On the same page, T. P. Rees is cited with reference to what the authors themselves call the "fanciful" localization of the id in the hypothalamus and of the super-ego in the frontal cortex; nevertheless, neither Rees' nor their own explanation of the effects of leucotomy is reconciled with a generous citation of the reviewer's work on page 170 which indicates that such formulations are highly questionable on both experimental and clinical grounds. Even more speculative and possibly misleading is a section (page 124) elaborating the concept that electroshock therapy cures the patient by somehow altering the "system of electric resonators" in the brain—although it is recognized that this "alteration" implies an abolition of complex adaptive capacities and a recourse to simpler but "psychologically more acceptable patterns." The authors nevertheless believe (page 134) that, "Many thousands of sufferers . . . are, if necessary, maintained in a state of good mental health by occasional electrically induced convulsions; and the time is fast approaching when every neuropsychiatric outpatient clinic will be equipped with an electric convulsant unit."

Buy the book; what there is objective in it is easily found, clearly stated, well evaluated, and more than worth the price of admission. Nevertheless, the reviewer can only continue to hope, somewhat wistfully, that more of his colleagues will divest themselves of the defensive body-mind dualism implicit in the terms "neuropsychiatry" or "endocrinopsychiatry" or, less objectionably, even "psychosomatics." Eventually, we may accept our science for what it is—a study of the total behavior of physiologically integrated human beings interacting with their personal and social milieu, as each conceives and interprets it in terms of his own abilities and experience. With this orientation there need be no bridges (nor hyphens) among biology, medicine, psychology, or sociology—let alone between neurology and psychiatry—since there are no artificial boundaries to bridge.

JULES H. MASSERMAN

TREDGOLD, A. F.: *Manual of Psychological Medicine*. Baltimore, Williams and Wilkins Co., 1945, 308 pp. \$5.00.

The author dedicates this book to the medical student and general practitioner, lest the "wide extent of Psychological Medicine may be lost sight of." Following an introductory chapter concerning the "Normal Mind," successive chapters deal with nomenclature, classification, causation, symptomatology, and specific psychiatric and neurologic entities. His nosology allows room for the extensive treatment of such subjects as "Mental Decay," "Moral Defect," and other such vestigia of the 19th century.

Great emphasis is laid, throughout the text, on the influence of deficient heredity as the cause of emotional maladjustment. Concerning the subject of mental disorder in general, he says, "In fact, it is now generally accepted that the most important causal factor of mental disorder is an inherited predisposition." In this he is not limiting the term "mental disorder" to any particular grouping, as is made amply clear in the text. This reviewer was under the impression that such shibboleths as "predisposition to mental disease" and "psychopathic diathesis" had been laid to rest. If so, Tredgold is struggling with their resurrection. In the discussion of "Mental Instability," the boundaries of which are nebulous, he states that this condition "is in most cases consequent upon a physiological peculiarity of brain." Similarly, the failure of some sufferers from traumatic neuroses to recover is due to "inherent emotional instability and lack of mental stamina." Various types of alcoholics have "a psychopathic inheritance," "a psychopathic heredity," are "constitutional psychopaths," and all the other possible variations of this theme.

The author was in a peculiar dilemma as to what to do with Freud. On the one hand, Tredgold seems content to invoke heredity as the cause, and describe the syndrome. On the other hand, it would apparently be unsafe to omit the utilization of Freudian concepts. The solution, therefore, lay in passing references to Freudian psychology, with the hasty conclusion that the facts are incompatible with Freud's theories. An example of the author's enlightenment is the statement that of the three "chief methods" of psychoanalysis, one is word association tests in which a list of selected words is read to the patient and he is asked to reply to each with the first thought coming to mind.

How the author succeeded in omitting all reference to sexual pathology is difficult to understand. Another fatal flaw in the text is the thoroughly inadequate presentation of the concept of the unconscious.

JOSEPH LANDER

KUNTZ, ALBERT: *A Textbook of Neuro-Anatomy*. Fourth edition. Philadelphia, Lea and Febiger, 478 pp. \$6.50.

This book achieves its purpose "to provide a comprehensive account of the anatomy of the human nervous system with sufficient physiological data to

link structure and function into a dynamic pattern." The usual standard descriptive material of a neuro-anatomy text has undergone a refreshing change in the author's hands in that it is meaningfully presented in terms of function and phylogenetic development. The student is led from the less complex, but basically significant, aspects of evolution, morphology and embryology of the nervous system to the more intricate patterns of conduction pathways, diencephalic and cortical structures and functions in a logical and comprehensible manner. A separate chapter on the autonomic nervous system incorporates much of the excellent material of the author's book on this subject. A helpful feature of the book is the summary at the end of each chapter, and additional teaching facilities are enhanced by an outline for laboratory study.

The author makes no significant departures from contemporary anatomic thought and leaves no basis for controversy or criticism. One notable aspect of this book, consistent with the thought of all similar texts, is the perpetuation of the teaching of the dualistic and materialistic concept of human behavior. This is stressed in the opening statement: "The understanding of human behavior, adjustments of the body as a whole or of its parts to factors in its external and internal environment and the regulation of vital processes through neural-mechanisms, like the intelligent diagnosis and localization of neural disturbances, depends on accurate knowledge of the anatomy and physiology of the nervous system."

J. LLOYD MORROW

LYON, E. G., JAMBOR, H. M., CORRIGAN, H. G., AND BRADWAY, K. B.: *An Experiment in the Psychiatric Treatment of Promiscuous Girls*. San Francisco, Psychiatric Service, City Clinic, 1945.

"Promiscuity representing an abnormal response to emotional and external environmental influences is a psychiatric problem. The control of venereal disease spread by such promiscuity is, in fact, a problem of psychosomatic medicine." Starting off from these considerations the City and County of San Francisco Department of Public Health entrusted, in 1941, a team of workers (psychiatrists, psychiatric social workers and a psychologist) with the task of studying the causative factors in promiscuity. The Department was prompted in this decision by the increasing number of girls and young women who were reported as contacts to venereal disease. Initial research led to the development of a Psychiatric Service in liaison with the San Francisco City (Venereal Diseases) Clinic. The experiences of this Service are laid down in the pamphlet to be reviewed.

Objectives of the Psychiatric Service are stated as follows: (1) to study the characteristics of promiscuous patients, (2) to determine whether or not psychiatric and case work services might be effective in diverting young women from promiscuity, and the potentiality of prostitution, (3) to discover the extent to which patients studied in the Service might be referred successfully to other psychiatric and case work

agencies in the community, (4) to ascertain the administrative feasibility of the Psychiatric Service as a part of a venereal disease clinic.

Altogether 365 girls and women were psychiatrically examined. Two-hundred and eighty-seven of them were classed as promiscuous and 78 as potentially promiscuous. Age served as the principal means of selection of patients, those 22 and under being referred routinely.

Much interesting material was obtained from personal and social histories. A majority of the group came from broken homes. Approximately 80 per cent had unresolved conflicts regarding their families. In many patients there was a strong feeling that their parents had been too strict and repressive regarding sex and companionship with boys and men. Although limited formal education and lack of vocational training were frequently associated with promiscuity, they were not found to be causative factors. Frequent changes in employment were characteristic of the patients as a group. In the histories of those patients who had been promiscuous prior to the war, economic factors did not stand out as especially important. Promiscuity for remunerative purposes was found in 5 per cent of cases. Approximately two-thirds of the promiscuous patients were living alone or with friends, usually in third or fourth rate hotels. Some girls, feeling friendless and lonely, became easily engrossed in an "overnight romance." An unusually high percentage of patients in the group studied had a criminal record. Incomplete and inaccurate information regarding sexual matters and feminine hygiene was outstanding in the group despite the fact that a majority had had sexual experiences far in advance of their years. Difficulties in relationship with husbands were prevalent. Sixty-one per cent of patients in this group were relatively or completely frigid.

The chapter on motivating factors in promiscuity is of special interest. There was no uniformity in the characteristics among the group. Certain characteristics, while not predetermining promiscuity, occurred frequently enough to suggest a direct relationship to promiscuous behavior. Among these basic factors were: unsatisfactory familial relationships, unstable interpersonal relationships, uneven development in physical, intellectual, emotional, and social maturity. For example, some patients had matured physically and intellectually, but were retarded in emotional and social areas. Assumption of self-direction was usually in advance of emotional maturity. Slightly more than one-half of the patients were found to be habitually promiscuous. In addition, there were groups who had sexual relations on a sustained affectional basis, on an episodic basis, or for whom no classification was made. Among those who were habitually promiscuous one-half fell into the conflictual group, whose promiscuity was the result of intrapsychic conflict. Promiscuity was used by these patients in an attempt to overcome frustrations, to overcome anxiety regarding sexual normality, to gain affection, or as a means of defying authority. Next in importance were the dependent group, whose

promiscuity was a problem of dependency and immaturity, and the maladapted group, whose sexual behaviour was another example of the maladapted behaviour characteristic of the unstable patient who lacks social responsibility and self-restraint. A small percentage fell into the non-conflictual group.

A majority of the group were ready and able to use at least limited service when they discovered that the approach of the Psychiatric Service was objective and non-judgmental. Not quite one-sixth of the patients availed themselves of intensive, prolonged treatment. An additional one-half of the patients utilized consultative service. Slightly more than one-third were not interested in service. A follow-up after six months showed encouraging results. "Changes observed in patients during the course of treatment suggested that they had benefited from the services given and in particular had modified their sexual behaviour." Resistances which were encountered among the patients when referral to other agencies was attempted suggest that, for the greater part, services can be used by this group of patients only if they are readily available in direct connection with a venereal disease clinic.

The authors are to be congratulated on their stimulating study which, it is hoped, will have far reaching practical results. For the reviewer who studied the psychiatric aspects of promiscuity in men it is particularly gratifying that the San Francisco group of workers undertook a parallel study in women and confirmed many of his own views. Nevertheless, it may be permitted to advance some constructive criticism. Indiscriminate promiscuity without a split between affection and tenderness on one hand and sexuality on the other is inconceivable; hence it is doubtful whether the term non-conflictual is appropriate for the group thus designated (page 35). The authors separate the dependent group from the conflictual group (page 36) whereas elsewhere they emphasize that conflicts over dependence are a common characteristic of promiscuous patients. Promiscuity seems to be a neurotic symptom rather than a "neurotic equivalent" (page 37). There are scattered references to conflicts over aggressiveness throughout the pamphlet and yet very little is said regarding their relevance for the psychopathology of promiscuity. No reference is made to inebriety so common in promiscuous patients. The authors state that they found no uniformity in the characteristics among the group (pages 32 and 66). It is felt that if an approach on a deeper emotional level than they attempted had been made, a uniformity might have emerged.

ERIC WITTKOWER

RIBBLE, MARGARET A.: *The Rights of Infants: Early Psychological Needs and Their Satisfaction*. New York, Columbia University Press, 1943, 130 pp. \$1.75.

"Unfortunately the idea is still disturbing to many people that mental life is so closely linked up with and so firmly rooted in other forms of primitive biological

activity, such as sucking, breathing and eliminating. These links between what is biological and what is psychological have never been made sufficiently clear." Dr. Ribble, out of a rich psychiatric experience and eight years' study of 600 healthy newborn infants, 20 premature babies and 100 expectant mothers, has attempted in this slim volume to delineate "these links." In wise clear words, she has made a psychosomatic contribution of the first order.

Dr. Ribble considers her subject in 13 short chapters devoted to the topics of mothering, oxygen hunger, sucking, feeling, sleep, premental behavior, elimination, schedules, thwarting, emotional development, thinking, fathers (two pages), and mental health.

The child has not one but three hungers, according to the author: food, oxygen and stimulus hunger. By the last is meant a need for mothering and the satisfaction of sucking and feeling wants. Without consistent mothering a baby has difficulty in patterning its eating, breathing and eliminating, and is handicapped in its ability to love and be loved. Here are some representative findings of the author.

"Mothering' a newborn baby helps him to breathe by bringing into action certain nervous reflexes which insure proper and necessary respiration."—"One mothering activity which is invariably overdone is that of diapering."—"The tension of waiting is for a young baby an actual threat to the stability of his entire organism."—"The ability to love [is] a highly complicated pattern of behavior, beginning physiologically at birth, when the first hungers are appeased by the mother, and developing psychologically in response to her presence and her care."—"Particularly has breast feeding gone out of vogue, and mothers say with spirit that they are not going to be cows. They seem even to prefer to be dinosaurs."—"Breast feeding is of the very essence of 'mothering' and the most important means of immunizing a baby against anxiety."

It is interesting that Dr. Ribble does not once use the term *psychosomatic*, although that word is eminently applicable to her subject. *Psychological* is frequently employed in the sense of *psychosomatic*. One wonders whether it was thought that the term would be strange or misunderstood—although psychosomatic medicine is obtaining a notoriety in both popular and medical literature, or whether there was an inner reluctance to use an appellative some consider ill-advised and infelicitous.

From deep *clinical* experience, Dr. Ribble has demonstrated, perhaps for the first time, the *physiologic necessity* for mothering, and the extensive connections between satisfaction of stimulus hunger (her term), healthy psychosomatic functioning and the ability to love.

This book should be the subject of medically-led group discussions—what the army calls group psychotherapy—with young mothers and fathers all over the country. It should be read by all pediatricians, psychiatrists and workers with infants. As Dr. Ribble says, "If human nature is to be changed, if individuals are going to be more self-secure, more rich in their capacity

to love, to think creatively, and to work through and solve problems of the world tomorrow, their early emotional [psychosomatic] hungers must be appeased."

LOUIS PAUL

BRANDT, HERMAN F.: *The Psychology of Seeing*. New York, The Philosophical Society, 1945, 220 pp. \$3.75.

Dr. Brandt has chosen a title for his small book which leads one to expect more than is forthcoming. The "Psychology of Seeing" as set forth by Dr. Brandt is a study of the behavior patterns with which the eyes scan pictures, copy and art set before them. Dr. Brandt's method is to photograph the movements of the eyes as they study these objects, by means of a special camera invented by him. As a matter of fact, this technique is not new and has been used for many years to study the reading habits of patients in the various reading clinics throughout the country. A standardized eye camera called the ophthalmograph has been used for this purpose. The first part of the book is devoted to an elementary description of scientific methods. The major portion of the book devotes itself to records of the findings in some detail (mostly how the eye observes advertising material), and the third part of the book is devoted to such conclusions as Dr. Brandt has been able to draw from his data. There is also a closing section on projected studies and technique, and although it is stated that ocular patterns are sufficiently alike so that certain psychological laws may be formulated, there are no noteworthy conclusions from the data the author has accumulated. The psychological implications and projected studies which close the treatise hardly seem to be as important as the author himself feels.

ROBERT K. LAMBERT

KUPPER, HERBERT I.: *Back to Life: The Emotional Adjustment of Our Veterans*. New York, L. B. Fischer, 1945, 220 pp. \$2.50.

Today there are appearing at rather frequent intervals books purporting to deal with the emotional maladjustments of the veterans of World War II. Most of these books indicate the reasons why the men and women who have entered the military services are to be expected to develop varying degrees of difficulty within the period of active service, followed by even greater problems when they attempt to make the transition back to the civilian world from whence they came.

Dr. Kupper's book is an interesting contribution which falls into the same category as described above. He shows by simple example, pulled from his own case-files, some of the reactions of "men at war" that result in the symptom-complexes that characterize the psychoneuroses. He supplies illustrations of the insecurity, the resentments against father-surrogates, the resistances to mother-son attachments, in short the whole gamut of experiences that play a role in making it difficult for many veterans to make an easy readjustment to their former jobs, their families and society

in general. The author explains the reason for the post war acceptance of many undemocratic activities and organizations on the part of those who have just returned from fighting for the preservation of democratic principles. The role of the undemocratic leader in supplying a sense of security because of removing responsibility from the veteran who is reluctant to accept it is stressed. Attention is granted to essentially all the significant psychological disturbances of men seeking to be at peace in a society which asserts that it is at peace.

Kupper's book is not unusual in its attempt to present this problem. Many writers have tried it and probably many more will try. His book is a bit unusual, however, because of the simplicity of his style of presenting the material. A layman can read it and what is more he can understand its content. Even more significant is the author's recommendations for solving this trying problem of veteran readjustment. Kupper points out the necessity for "the rehabilitation effort" which he says "should certainly be directly incorporated into the veterans' groups." He emphasizes the virtual "group psychotherapy" obtained through veterans' organizations and points out that "an objective, trained observer to take part in their 'bull sessions' would provide a manner of reaching thousands of normal human beings who, with the slightest guidance, can adjust themselves much more easily than would otherwise be possible."

All in all this is an excellent book for every one who is going to deal with veterans' problems. Professional worker, veterans' organizations personnel, fathers, mothers, wife, sister, brother, and the veteran

who wants to understand himself can well afford to purchase it and read it over and over again.

MORTON A. SEIDENFELD

BOOKS RECEIVED

- BENEDICT, RUTH FULTON: *Patterns of Culture*. New York, Penguin Books, 1946, 272 pp. 25¢.
- CUNNINGHAM, BESS V.: *Psychology for Nurses; Designed and Written for Student Nurses*. New York, Appleton-Century, 1946, 356 pp. \$3.00.
- DEUTSCH, ALBERT: *The Mentally Ill in America*. New York, Columbia University Press, 1946, 530 pp. \$4.00.
- LEWIS, N. D. C., AND PACELLA, B. L.: *Modern Trends in Child Psychiatry*. New York, International Universities Press, 1945, 341 pp. \$6.00.
- LIEBMAN, JOSHUA LOTH: *Peace of Mind*. New York, Simon and Schuster, 1946, 203 pp. \$2.50.
- LINDNER, ROBERT M.: *Stone Walls and Men*. New York, Odyssey Press, 1946, 496 pp. \$4.00.
- Mental Disorders in Later Life*. Edited by OSCAR KAPLAN. Stanford, Stanford University Press, 1945, 436 pp. \$5.00.
- STIEGLITZ, EDWARD J.: *A Future for Preventive Medicine*. New York, Commonwealth Fund, 93 pp. \$1.00.
- Trauma of the Central Nervous System*. Edited by the Association for Research in Nervous and Mental Diseases. Baltimore, Williams and Wilkins Company, 1945, 679 pp. \$8.00.
- Twentieth Century Psychology*. Edited by PHILIP LAWRENCE HARRIMAN. New York Philosophical Library, 1946, 712 pp. \$6.00.

RUTH READ COLEGROVE

The Officers and Staff of the American Society for Research in Psychosomatic Problems are deeply grieved by the sudden death on May 16th of Ruth R. Colegrove, our General Secretary. The cooperation and intelligence which Mrs. Colegrove contributed during her association with us were invaluable to the Society. Her administration was gracious and competent. We all know how great a part of the success of the Annual Meeting is owed to her fine management. Mrs. Colegrove gave unselfishly of her high abilities. We have lost a real friend and sincere worker.

STUDIES ON HEADACHE: MECHANISMS OF CHRONIC POST-TRAUMATIC HEADACHE *

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Almost all persons who have had injury to their heads have local pain or tenderness at the site of impact for a few hours, or even for a few days, following their injury, after which many become symptom-free.

Between one-third and one-half of all persons who injure their heads sufficiently to warrant hospitalization develop chronic post-traumatic headaches (11, 1).

A small number of patients with headaches that persist after injury to the head have pain due to gross accumulations of blood in the epidural, subdural or subarachnoid spaces. The headache of subdural hematoma begins and persists often for months or years from the time of the blow or the regaining of consciousness until the hematoma is removed or, rarely, until spontaneous resolution occurs. Large amounts of blood in the subarachnoid space about the base of the brain induce headache because of traction, displacement, distention, and rupture of pain-sensitive blood vessels and pia arachnoid (9, 10, 14). A still smaller group of patients have sustained headache after head injury due to adhesions involving pain-sensitive structures in the arachnoidea (12, 13).

The vast majority of patients with post-traumatic headaches that persist or recur for long periods of time after head injury have no such intracranial abnormalities to explain their headaches. It has been the purpose of this study to ascertain the mechanisms in this dominant group of post-traumatic headaches.

MATERIAL

Sixty-three patients with the complaint of headache following injury to the head have been studied.

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Most of the injuries were sustained in military situations, the remainder at home or in industry.

All patients intensively studied were known to have no epidural, subdural, subarachnoid, or parenchymatous hemorrhage at the time of observation. Fifty-two percent (33 patients) were known to have had cerebral and meningeal damage as evidenced by operative visualization, electroencephalogram or pneumoencephalogram. Some portion of the remainder may also have had cerebral or meningeal damage, but it was not demonstrable. Several patients had had more than one head injury with loss of consciousness with each accident. The headaches were of two months' to fourteen years' duration. In no instance was headache the only complaint.

The headaches following injury to the head in this series were divided into 3 types. Headaches of Types 1 and 2 are closely allied and often indistinguishable, yet for purposes of analysis they have been arbitrarily separated in this study: (1) a steady "pressure sensation" or aching pain in a cap-like distribution or, more commonly, in a circumscribed area elsewhere than at the site of injury and usually associated with deep tenderness on manual pressure; (2) in addition to Type 1 headache, a circumscribed, relatively superficial tenderness at the site of impact or in a scar, often associated with aching pain of moderate intensity; (3) an aching pain, often throbbing, occurring in attacks, usually unilateral in onset, and chiefly in the temporal, frontal, post-auricular, or occipital region, occasionally combined with Type 1 headache.

OBSERVATIONS, HEADACHE, TYPE 1

Headache, Type 1, was the most frequent and troublesome variety of head sensation following head injury. All of our patients (63 cases) suffered from this type. All patients (15) having Type 2 headache had Type 1, as did also all patients of Type 3 (4). However, 44 patients (70%) had Type 1 headache alone. The head sensations, when painful, were of a dull, aching quality. There was deep tenderness, and headache could often be reproduced by manual pressure upon these tender areas. The non-painful components were described as a sensation of "weight" on the head, of "pressure"

from without, of a "tightness like a cap" covering the whole calvarium, or of a sensation like a "tight band" around the head. The intensity of pain, when present, varied from mild to very severe (1 plus to 8 plus intensity on a scale of 1 plus to 10 plus, the latter being of maximal intensity). Recurrent head pains of this type often occurred for many years. The headache attacks were intermittent, varying from a few hours to ten days in duration.

It should be emphasized that for the greater part of the time and between the headache attacks, the head sensations, which were the basis of complaint in this type of chronic post-traumatic "headache" syndrome, were not actually pain. These sensations were experienced at the vertex, circumferentially over the eyes or at the base. All patients were tense, anxious, resentful, fearful, and more or less dejected. The headache and other head sensations were commonly made worse by effort, stooping, coughing, or turning the head. Mental concentration and emotional tensions involved in making decisions or associated with conflicts from divergent drives also accentuated the pressure sensations. During periods of asthenia, exhaustion and prostration, headaches and other head sensations were usually more frequent and more intense. The intensity of the head sensations or pain was reduced for shorter or longer periods by medication, by massage, or by any other device which induced muscle relaxation.

Occasionally spinning sensations and frequently "dizziness" and photophobia were accompaniments of this type of headache. The "giddiness" was commonly a sensation of "unsteadiness," "swimming," "uncertainty," or "falling," and was made worse by head movements when the latter accentuated the pain. The "giddiness" was seldom accompanied by nystagmus, and the spinning sensation was rarely as severe as that of Ménière's or labyrinthine syndromes. It did not induce nausea or vomiting but was sometimes associated with anorexia. The "giddiness" was increased by manual pressure upon tender regions about the base of the skull or behind the ear.

Mechanism of Post-Traumatic Headache, Type 1 Series 1

Muscle potentials were present at or near sites of disagreeable head sensations. The muscle potentials commonly increased with an increase in the intensity and decreased with a decrease in the intensity of pain.

Method: Muscle potentials were registered with

a two-channel ink-writing oscillograph of the Grass type by means of solder and needle electrodes applied bilaterally to the scalp over the frontal and into the temporal and cervical muscles. Records were made with the patients in a relaxed, neutral, sitting-up position, found by experiment to be most satisfactory. The electrical potentials from the right and left sides were registered simultaneously for comparison. Approximately 30-second samples of muscle activity were recorded from the three areas in succession. Immediately before each recording the subject reported the presence or absence of headache, its intensity, and other head sensations, and his report was written on the electromyographic tape. Subjects estimated their headache on the basis of an arbitrary scale, 10 plus representing maximum or extremely intense pain.

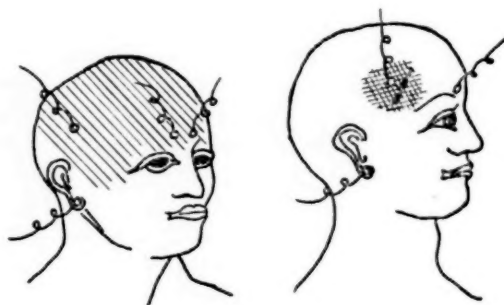


FIG. 1. The distribution of headache (single hatching) in patient F. S., the area of deep tenderness (cross hatching), the operative scar, and the location of electrodes.

In the analysis of the records, the amount of muscle activity is estimated on a scale of 1 to 10 plus in which the latter represented the maximum of amplitude and frequency of muscle potential which could be recorded by the instrument. The amount of muscle activity was then described, on this basis, as "minimal" (up to 2 plus) to "grossly exaggerated" (from 2 to 5 plus).

The following protocol is illustrative of the relation between muscle potentials and the post-traumatic headache of Type 1. Patient F. S., a 23-year-old Marine, was rendered unconscious by a bomb burst on Guadalcanal in December, 1942. Because of persistent headache following this accident, his head was subsequently explored bilaterally for subdural hematomata. Xanthochromic fluid was found, but no hematomata. Following these surgical procedures he continued to complain of almost continuous headache of the Type 1 variety, with 1 to 2 plus pain in the frontal and right temporal areas and in the area to the right of the vertex, with 5 plus pain in the right frontal area (see figure 1).

During one of the brief spontaneous remissions of this headache, on September 3, 1943, the patient visited the laboratory, free of all complaints and in good spirits. The electromyograms recorded on this headache-free day from the previously painful areas showed no muscle potential. A sample of the record is shown in figure 2. On September 8, 1943, he re-visited the laboratory complaining of his usual headache, which on this day was of 5 plus intensity in the bifrontal and bitemporal areas. He was tense, dejected and irascible. The electromyograms recorded at this time showed exaggerated muscle potential from all electrodes. A sample of the record from the right temporal area is shown in figure 3.

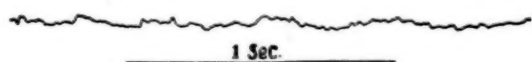


FIG. 2. Sample of electromyogram showing no muscle potential from the right temporal area of patient F. S. on a headache-free day.

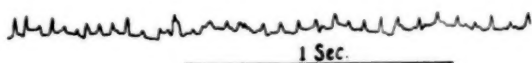


FIG. 3. Sample of electromyogram showing exaggerated muscle potential from the right temporal area of patient F. S. on a day when he had 5 plus headache which was bifrontal, bitemporal and worse on the right.

The data on a total of 63 patients who were studied by electromyography are presented briefly in the following paragraphs:

(1) Sixty-two patients had definite headaches or other precisely definable and disagreeable head sensations; one gave an indefinite account of his head sensations.

(2) Fifty-nine patients had one series of electromyographic studies; in 4, 2 or 3 separate series of electromyographic studies were made.

(3) Of the 62 patients with definable sensations, all but one had headache for three months or more; 25 patients for three to nine months; 15 patients for ten to eighteen months; and 19 patients for periods of a year and a half to ten years. One exceptional patient had had headaches for thirteen years, and one other for fourteen years.

(4) Of the 62 patients with definable sensations who had headache at one time or another, 37 had headache at the time of the electromyographic study.

(5) Myograms were made on 37 patients when headache was present. In about three-quarters (28), there was evidence of muscular activity in the head or neck muscles. In more than half of this latter group (16), there were excessive muscle potentials indicating gross overactivity of the muscles of the

head or neck. In the remainder (12), there was minimal but abnormal activity.

In about two-thirds (17) of the 28, the muscle activity was greatest at the site of the head sensation, although such activity was noted elsewhere as well. In 4 of the remaining 11, muscular activity was recorded in the neck, although the headache was frontal or temporal.

(6) In 24 patients, records were made during headache-free periods, and no muscle contractions were noted in two-thirds of this group.

Comment

Three-quarters of the patients with headache at the time of the observation had evidence of muscular activity, whereas two-thirds of those who had no headache at the time of the observation had no evidence of muscular activity. It was noteworthy that in about one-third of patients with "headache," the amount of muscular disturbance was just above the physiologic limit at rest. It probably was the basis of complaint because it was sustained and because of an abnormal preoccupation with the head.

It is probable that, in the remaining one-quarter of patients with Type 1 headache who gave no evidence of exaggerated muscle potentials, the needle and surface electrodes were not properly placed. Thus, Elliott (25) has shown in patients with painful muscle contraction in the leg that when the needle electrodes are placed directly into a small focus of tenderness, the so-called rheumatic nodule, violent action potentials can be recorded, whereas adjacent muscles may be relatively or even completely inactive. In other words, the muscle contraction may be in some instances extremely local, even though the pain is diffuse.

Weddell (26) has also noted such sharply-defined muscle contraction, with its concomitant disturbance in muscle potential, in patients with painful contraction in the leg, although commonly the adjacent muscles also show action potentials. The latter may not be as great; nevertheless, they indicate diffuse muscle contraction.

"Pressure" or "tight" sensations arise from the sustained contraction of skeletal muscle, located in the frontal, temporal, occipital, and cervical regions. "Tightness" or other non-painful experiences when persistent may be misinterpreted as pain if the patient is anxious, depressed or alarmed as to the implications of the head sensations. Moreover, such contractions may become so intense as to give rise to cramp-like, aching pain which is intensified by

head movements, by arising from the lying-down position, or by mental concentration and conflict. There are then usually regions of tenderness when manual pressure is applied.

Since all of the patients in this study were tense, anxious and fearful, it is likely that in some instances they over-reacted to minimal head sensations which would otherwise have been disregarded.

Series 2

The injection of 1% procaine hydrochloride into zones of deep tenderness eliminated existing headache and made impossible the experimental reproduction of headache by deep manual pressure.

The protocols on the following 3 patients who had pain in different areas and who received injection

of 10 cc. of 1% procaine hydrochloride into the trapezius muscle on the left, fanwise from a point 2 cm. below the occipital attachment, was immediately followed by the complaint of intense (10 plus) pain in the area injected. The patient reacted with profuse perspiration, marked pallor and nausea. During this period of intense pain, muscle potential was grossly exaggerated in the frontal, occipital and cervical regions. A representative sample, shown in figure 6, is taken from the

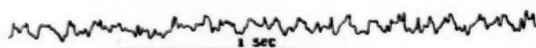


FIG. 5. Sample of electromyogram showing exaggerated muscle potential from the left temporal region of patient S. P. He complained of headache of 7 plus intensity in the left frontal, temporal, parietal, occipital, and cervical regions.

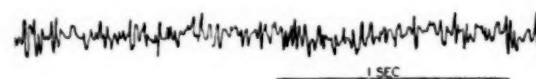


FIG. 6. Sample of electromyogram showing exaggerated muscle potentials from the left frontal region of patient S. P. immediately following injection of 10 cc. of 1% procaine hydrochloride which induced intense pain for approximately half a minute before analgesia was established. The procaine was injected into the left trapezius muscle 2 cm. below its occipital attachment, and the intensification of pain was experienced both locally and in the frontal region.

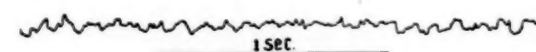


FIG. 7. Sample of electromyogram from the left frontal region of patient S. P. showing elimination of exaggerated muscle potentials with elimination of headache when analgesia was established following injection of 10 cc. of 1% procaine hydrochloride.

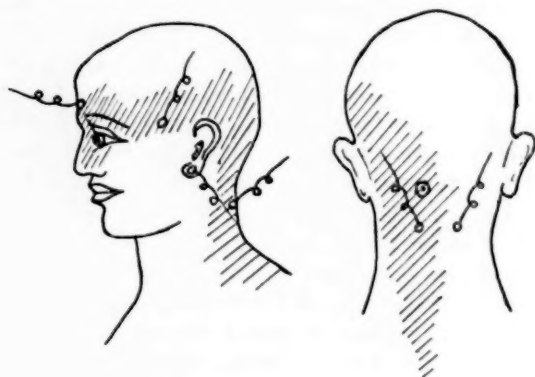


FIG. 4. The distribution of headache (single hatched areas) in patient S. P., the location of electrodes and the site of injection of procaine (⊙).

tions of 1% procaine hydrochloride were selected as representative of the 44 patients of this type. Electromyograms were recorded before and after the injection in 2 patients.

The patient, S. P., was a coast guardsman, aged 21. He complained of almost continuous headache, sometimes as intense as 7 plus, for three years following a fall on the ice when he had hit his head. On September 20th he visited the laboratory with a headache of 7 plus intensity in the left frontal, temporal, parietal, occipital, and cervical regions (see figure 4). He was pale, dejected and tense. At this time electromyograms revealed a moderate amount of muscle potential abnormality in the temporal, occipital and cervical areas. The sample, figure 5, is taken from the record of the temporal region. The occipital and upper cervical regions were found to be tender on manual pressure, which increased the intensity of the headache both locally and in the frontal and temporal regions. The injection

of 10 cc. of 1% procaine hydrochloride into the trapezius muscle on the left, fanwise from a point 2 cm. below the occipital attachment, was immediately followed by the complaint of intense (10 plus) pain in the area injected. The patient reacted with profuse perspiration, marked pallor and nausea. During this period of intense pain, muscle potential was grossly exaggerated in the frontal, occipital and cervical regions. A representative sample, shown in figure 6, is taken from the

left frontal region. Within a minute after the injection, the intensity of the pain diminished, and when deep analgesia about the area of injection was established the headache was minimal in all areas. A sample of the electromyogram recorded at this time from the left temporal area is shown in figure 7. When the patient, F. S., the 23-year-old Marine described in Series 1, visited the laboratory on September 8th, with 5 plus headache in the bifrontal and bitemporal areas, he also had extreme tenderness, on manual pressure, in the right temporal area (figure 1). Furthermore, pressure upon this area increased the intensity of the headache from 5 to 7 or 8 plus. Myograms from this tender area showed exaggerated muscle potentials (figure 8). Five cc. of 1% procaine hydrochloride was then infiltrated into the right temporal muscle. Five

minutes after the injection the headache was eliminated, and firm pressure upon the right temporal area no longer elicited tenderness or pain. Also, the electromyograms showed no muscle potentials at this time (figure 9).

The patient, C. T., a 44-year-old automobile mechanic, complained of bifrontal and occipital headache since he fractured his skull two years before. The headache in the right frontal area was most intense and varied from 1 to 7 plus. At the time of this observation his headache was of 5 to 7 plus intensity and there was tenderness on manual pressure in both frontal areas, over the vertex and in the occipital region. This patient's accident had been followed by a three-week period of unconsciousness, a right-sided hemiplegia and subsequent

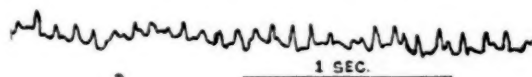


FIG. 8. Sample of electromyogram showing exaggerated muscle potentials from an area of tenderness in the right temporal area of patient F. S. during a 5 plus headache.



FIG. 9. Sample of electromyogram from the right temporal area of patient F. S. showing elimination of exaggerated muscle potential with elimination of headache following injection of 5 cc. of 1% procaine hydrochloride into the right temporal muscle.

aphasia, from which he recovered sufficiently to become ambulatory. He had, at the time of the observation, a slight mentation defect, as indicated by mental testing procedures, and some residual motor and sensory disturbances which, together with electroencephalographic and pneumoencephalographic studies, indicated structural brain disease. However, when 8 cc. of 0.5% procaine hydrochloride was injected deeply into the tender regions over the vertex, and in the right lower occipital region, headache was eliminated.

Series 3

Passive and active movements of the head and neck modified the intensity of the headache.

In all of the patients investigated with headaches of Type 1, and who had headache at the time of the observation, it was possible to demonstrate in each patient that certain head movements made the headache worse, whereas others diminished its intensity. The requisite movements varied from patient to patient. Electromyographic records from patients in whom pain was either increased or

decreased by active or passive muscle movement showed corresponding increase or decrease in action potentials (18).

Comment

Despite the evidence from mental testing procedures, pneumoencephalographic and electroencephalographic studies that patients F. S. and C. T. had structural and mentation defects, the above observations indicate that the head sensations in all 3 patients were of extracranial origin.

Simons, Day, Goodell, and Wolff (18) have shown that contraction of the skeletal muscles in the head and neck may result reflexly and secondarily from noxious impulses from any part of the head, either inside or outside. On the other hand, these skeletal muscle contractions may be part of a sustained postural contraction in a pattern of tension, anxiety or fear. In both, the sustained contraction may result in paresthesia or pain. One may not infer from electrical overactivity in skeletal muscle which of the two varieties of circumstance is the precipitating factor. Furthermore, the elimination of pain by procaine injection of the muscle, by massage, or by other factors that lead to relaxation of the muscle may not be used as evidence concerning the basis of the sustained muscular contraction. All that may be inferred is that the major portion, if not all of the pain, arises in structures on the outside of the head and probably results from sustained contraction of skeletal muscle. That such a mechanism may operate to produce the Type 1 variety of chronic post-traumatic headache follows from the evidence here presented.

Further, as indicated elsewhere (24), there may occur central spread of the effects of noxious stimulation from one part of a neural segment to ultimately include all structures supplied by the same segment and even adjacent segments. This phenomenon causes pain to be experienced remote from the original zone of noxious stimulation, in both superficial and deep structures.

Cyriax (3) demonstrated that injections of 0.1 cc. of 4% solution of sodium chloride into the posterior cervical muscles close to their occipital insertion, and into the occipitalis itself, gave rise to a pain which ran forward, forming a band half-encircling the head and reaching its maximum intensity in the temple and forehead over the eye. Injections of salt solution between 2 and 5 cm. below the occiput induced pain in the back of the head up to the vertex. Similar injections below this point caused pain in the cervical muscles only. Injections into the upper end of the sternomastoid muscle caused pain to be

experienced in the temporal region. Injections into the epicranial aponeurosis caused pain to be experienced behind the eyes.

Campbell and Parsons (2) confirmed these observations, and patient S. P. of this Series 2 offers further evidence of the spread of pain from the occipital region to the anterior portion of the head. With such spread of pain, action potentials from the muscles involved in the zone of spread may be present or absent, but procaine injected into such muscles will reduce the intensity of the headache only locally, whereas procaine injected into the primary site of noxious stimuli within the muscle will abolish all of the headache.

OBSERVATIONS, HEADACHE, TYPE 2

Included in this group were 15 patients (about a quarter of the total) who, in addition to Type 1 headache, had a clearly defined and relatively superficial tender zone at the site of the original injury, often but not always associated with a visible or palpable scar. This tender area sometimes became the basis of complaint only when some pressure, such as that of a hat or a comb, was applied to it. Such headaches were experienced for the most part about the site of noxious stimulation. But usually there was spontaneous aching pain in this region, either continuous or intermittent.

Palpation sometimes revealed adherence of the scalp to the scar. Sometimes the skin, without actually being ruptured, appeared atrophic. Such tender areas were irregularly ovoid in shape and were from 1-3 cm. in their longest axis. The life span of the complaint was variable. Nine had had their symptom less than a year, although 3 patients had had aching pain in the region of tender sites or scars for two years or more. In every patient, as indicated above, with such tender zones or scars, there was also less clearly circumscribed and more remote aching pain, described as Type 1 headache.

The Mechanism of Post-Traumatic Headache, Type 2

Series 4

Noxious stimulation, such as pressure, upon sites of local scalp tenderness or scars reproduced the headache spontaneously experienced or, if a headache was already present, increased its intensity. The injection of procaine into such sites eliminated headache and tenderness locally, but remote "cap" and "pressure" sensations and aches characteristic of the concomitant Type 1 headache often persisted for some time or were not affected. Examples are as follows:

(1) Patient M. C. complained of "head pressure" and pain from a superficial, tender area approximately 3 cm. in diameter at the left of the midline in the region of the coronal suture since a head injury twenty-two months before. The tender area was pressed upon and the skin and subcutaneous tissues moved from side to side, forward and backward and in a circular direction for a period of three minutes. This manipulation increased the pain and sensation of "head pressure."

(2) Patient F. D. complained of a constant ache and a tender spot on manual pressure in the right parieto-occipital region following a blow on the head in that region six months previously. The injection of 2.5 cc. of isotonic saline solution intra- and subcutaneously into the tender area at the site of the injury increased the local pain from an intensity of 1 plus to an intensity of 3 plus. The subsequent injection of 0.5% procaine hydrochloride subcutaneously and intracutaneously in the same area eliminated both local tenderness and pain.

Comment

Aching pain does not arise from the superficial layers of the skin, and yet aching pain and tenderness in this patient were first increased by distending these tissues with saline and then eliminated by intra- and subcutaneous injection of procaine. It is likely, therefore, that the distention resulting from the saline displaced deeper pain endings and that the procaine infiltrated perivascular and other deeper pain structures.

It is inferred that the tender zones and aching pain of Type 2 headache result from stimulation of nerve endings involved in the locally damaged tissue, because of lowered threshold associated with local nerve defect and abnormal healing.

The observations of White and Warren (22) on immersion foot may be relevant here. After such injury to an extremity, aching pain and rigidity may persist for long periods. These authors have shown that these symptoms "are due to an increase in interstitial connective tissue and collagen. It involves the blood vessels, muscle fibres and nerves. The last are embedded in fibrous tissue and show endoneurial fibrosis as well."

Weddell (26) has made a study of a series of painful scars and has observed similar fibrosis, but in addition he described abnormal nerve structures. These are bulbous swellings at the end of fine, naked, unmyelinated nerve fibers identified as afferents for noxious stimuli. The predictability of occurrence of these bulbous endings has led Weddell

to hold the opinion that such structural abnormalities cause these fibers to have a lowered threshold and that, therefore, ordinarily non-painful stimuli cause the patient to experience pain. It is also significant that this structurally abnormal state may persist in some instances for long periods, his histological study including tissue from one patient whose scar had been tender for six years.

Jones and Brown (8) have also noted that chronic post-traumatic headache may have its origin in injured soft tissues about the head and neck. Thus upon surgical exploration on several patients they found varying degrees of connective tissue reaction. Such scar formation about a "neurovascular bundle" they considered to be a cause of post-traumatic headache. They were able to eliminate tender points and headache in some of their patients by procaine infiltration of such areas.

It is therefore suggested that the Type 2 headache results from traumatic myositis, fibrositis or periositis, which causes also the local tenderness at the sites of injury.

GENERAL DISCUSSION, TYPES 1 AND 2 HEADACHE

It has been indicated above that noxious stimuli originating both inside and outside the head can induce sustained contraction of skeletal muscle of the head and neck. It remains, therefore, to consider whether secondary reflex effects of noxious stimuli from within the head play a major or a minor role in inducing painful muscle contractions.

Small amounts of blood in the subarachnoid space and the injury of bone and meninges usually fail to induce pain for long periods, a statement supported by the fact that long-lasting headache as a sequel to head injury produced by neurosurgery is uncommon. A study of patients at the New York Hospital revealed that chronic headache is rare after craniotomy and complete removal of meningiomas, gliomas, neuromas, and hematomas. Actually, the characteristic sequence after operation is a few days to a week of headache, rarely two weeks, and then a subsidence of all discomfort.

Sustained, chronic or recurrent headache persisting longer than two months following spontaneous subarachnoid hemorrhage is rare in patients who have not had headaches before the accident (23). Yet the opportunity for arachnoidal adhesions is as great as after subarachnoid hemorrhage from a head injury. Similarly, after meningococcus meningitis chronic headache is rare. The inference from these considerations is that, despite severe brain trauma with meningeal damage and scarification, often associated with severe mental, motility and sensory defects, headache is uncommon.

Nonetheless, in a few instances intracranial structures are the source of the noxious stimuli which result in chronic post-traumatic headache. In this category, in addition to the headache associated with subdural hematoma, would be placed those headaches that are due to arachnoidal adhesions and the fibrotic organization of hemorrhage about pain-sensitive structures within the cranium. Penfield (12), and Penfield and Norcross (13) have studied a group of patients who exemplify this mechanism in operation.

Also, Penfield and Norcross have reported observations made during operative visualization upon 4 patients suffering from chronic post-traumatic headache. They found numerous adhesions between the dura and the arachnoidea. "Separation of these adhesions with a curved instrument produced pain—and the pain the patient likened to the pain he had habitually on coughing or sneezing." They inferred that the pain arose from the traction of these adhesions on the pain-sensitive dural arteries. Ross and McNaughton (15) report that in 2 patients with chronic post-traumatic headache who had surgical exploration, traction upon such adhesions reproduced the patient's pain.

The fact that subdural adhesions occur after every craniotomy without producing headache was recognized by Penfield and Norcross, and explained by stating that "in cases of traumatic headache there is shifting of the normal relationship of the brain to the overlying dura, so that traction is eventually exerted on the adhesions." Such a "shift" was produced experimentally in one of 8 cats subjected to head injury. On the basis of these observations, Penfield introduced the procedure of subdural insufflation of air. He reported good results in the relief of most patients with post-traumatic headache. However, in a follow-up study of Penfield's patients undertaken some twenty years later, Ross and McNaughton were "able to report few cases in which the patient was cured or considerably improved several months to a few years after the procedure."

From these various considerations it seems likely that noxious stimuli arising from within the head and causing pain either directly or reflexly are factors of relatively minor significance in the causation of chronic post-traumatic headache.

OBSERVATIONS, THE RELATION OF CHRONIC POST-TRAUMATIC HEADACHE, TYPES 1 AND 2, TO HISTAMINE HEADACHE

Series 5

Sixteen patients with post-traumatic headache of Types 1 and 2 received intravenously 0.1 to 0.2 mg. histamine phosphate, the amount depending upon

the amount necessary to produce headache. No unusual sensitivity to histamine was noted. The amount of the agent required was no more than is usually required to produce a headache, and the intensity and duration were not exceptional. The histamine headache was of a deep, aching quality. It was not equally intense everywhere but chiefly occipital and frontal, regardless of the site of injury or zones of tenderness. In most instances it had a throbbing quality, which was absent in the post-traumatic headache (Types 1 and 2).

Three patients had tender scars and were having post-traumatic headache at the time of the histamine injection. Although the histamine headache was diffuse, 2 had histamine headache most intense at the scar. One patient who had no tender scar experienced his histamine headache most intensely at the site of his injury. In the remaining 12 patients, regardless of the site of injury, and whether or not post-traumatic headache was being experienced at the time of injection, no specific localization of the histamine headache was noted.

Comment

Friedman and Brenner (4) inferred from the study of patients with post-traumatic headache who received intravenous histamine injections "that headaches were produced by the injection which were identical in both character and location with the post-traumatic headache of which the patient had complained." They suggested that "the reproduction of the post-traumatic headache by injection of histamine indicates persisting and localized increase of vascular sensitivity following trauma" (4) and that "the mechanism of production (of post-traumatic headache) is the same for histamine headache" (11).

It is inferred from these histamine studies of Series 5 that in these patients with post-traumatic headache, as in all other persons, histamine headache can be induced by intravenous injection of this agent. The aching quality of the 2 headaches was similar, but in no instance was the post-traumatic headache in this series of a throbbing nature whereas it was common during the histamine headache. Three of the 16 patients had most intense histamine headache at the site of head injury.

However, the differences in intensity and localization were not significant enough to allow of the inference that cerebral vessels had been specifically sensitized to histamine as a result of the injury.

OBSERVATIONS, HEADACHE, TYPE 3

Four (7%) of 63 patients had this type of headache as a primary complaint. It was characterized

by its relatively short duration, recurrence and periodicity, throbbing nature, dull, aching quality, and associated anorexia, nausea and vomiting. In location it was usually temporal, but sometimes frontal, postauricular or occipital, and sometimes it involved the eye. It was usually unilateral in onset, often becoming generalized. Frequently, distended arteries or veins could be seen or palpated at the site of the headache. The intensity of pain varied from 2 to 8 plus. The headache often began in the early hours of the morning, or it was present when the patient awakened, and continued all day. The intensity of the pain was increased by effort, coughing, bending, or lying down. It was not modified by massage, heat or sedation; but icebags, cold compresses, digital compression of the common carotid artery on the corresponding side of the neck and of the region of the head involved, and codeine sulfate reduced the intensity of the pain.

These individuals had, in addition, sensations of head tightness, "bands" or "weights" and steady ache which were intermittently present between the above-described headache attacks, features characteristic of the Type 1 headache.

A profound depression and anxiety accompanied the headache, and prostration was usual. After the headache attack was ended, the depression and prostration often persisted for hours, and then gradually the individual recovered completely or he became aware once again of the tightness, band or weight sensations in his head. Tension, exhaustion and fatigue usually precipitated these attacks. Such patients had had infrequent headaches of a similar nature before the head injury.

The Mechanism of Chronic Post-Traumatic Headache, Type 3

Series 6

Ergotamine tartrate eliminated the headache of Type 3 but did not directly influence the Type 1 components. The following protocol is representative.

Patient J. M., a Puerto Rican merchant marine cook, aged 33, complained of headache since a head injury sustained three months before. He had fallen five feet to the floor from his bunk, striking the back of his head, and was unconscious for two hours. Though long a tense, anxious, rigid, perfectionistic person, since the accident he had grown increasingly irritable and complained of poor memory and attention. He was especially anxious and disturbed because of the probability of induction into the Army within a short time. His interview and test procedures indicated a psychoneurosis,

and electroencephalograms revealed evidence of brain damage.

He had 2 varieties of headache: The first was of high intensity and throbbing, and occurred in recurrent attacks in the frontal and temporal regions, once or twice a week, and lasted eight to ten hours. It was increased in intensity when lying flat, and reduced by sitting upright. Also, it was reduced in intensity or eliminated by digital pressure on the temporal artery. Associated with the headache were anorexia and nausea. This type of headache he had had at infrequent intervals for many years.

The second type of headache was also intermittent, but of less intensity. It was sometimes associated with, but occurred independently of, the throbbing headache attacks. It was chiefly occipital, and was of a steady, cramp-like quality, alternating with a feeling of a "band" or "tightness."

He presented himself on April 4, 1944, with both varieties of headache described above; *i.e.*, an intense throbbing headache in the temporal and frontal regions, and a steady tight sensation bordering on ache in the occipital region. Electromyograms revealed exaggerated muscle potentials in the occipital and temporal regions. An intramuscular injection of 0.5 mg. ergotamine tartrate eliminated the throbbing frontal and temporal headache in seventeen minutes. The occipital sensations were not significantly modified by the ergotamine tartrate.

Similar elimination of Type 3 headache by injection of ergotamine tartrate was observed repeatedly in all 4 patients of this series.

Comment

It was inferred that the headache which was eliminated by the ergotamine tartrate in these patients resulted from painful distention of cranial arteries (6).

Ross and McNaughton (15) also found that this type of post-traumatic headache was eliminated by the administration of ergotamine tartrate.

Watts *et al.* (20) suggested that the headache and dizziness which follow head injury are sometimes due to contusion of the scalp and appear to be related to the scalp arteries. They found in a small group of patients that when headache was experienced at the site of injury, procaine infiltration around the scalp artery in the contused area temporarily relieved the headache, and that when a chronic headache could be completely relieved for several hours by procaine injection around the

appropriate artery, resection of a piece of artery gave the patient "long-lasting relief." These authors described 4 cases of localized headache following trauma to the head, in which such resections were performed. One of these was completely relieved of head pain (eight months between operation and report); another obtained no relief; a third was free of pain for eleven months, when 2 headaches occurred at the site of the original pain; the fourth was very much improved by the operative procedure but had occasional spontaneous pain, and pain could be induced by tapping the forehead. It is likely that Watts was dealing with patients with the Type 3 headache just described, and it is conceivable that some of those patients described by Friedman and Brenner (4), as having their post-traumatic headache reproduced by histamine, also had this type of headache.

All of the patients having this vascular type of headache have sometimes, in addition, the aforementioned "cap," "weight" or "pressure" sensations resulting from muscular contraction as described under Type 1 headache. Therefore, both types of headache often occur in the same individual: (a), sustained discomfort which may be merely a sensation of tightness merging into a sustained cramping, aching pain which is made worse on movement or change of position and is of muscle origin, and (b), a recurrent, throbbing headache associated with anorexia, nausea and vomiting, and reduced in intensity or eliminated by ergotamine tartrate. It may not be inferred that this type of headache has resulted from any direct damage to the cranial vasculature. Sustained resentment, tension, frustration, and exhaustion precipitated perhaps by the injury to the head were important to these patients as are such states to other patients with vascular headaches and migraine.

The Mechanism of Scotomata Associated with a Sudden High Intensity Head Pain

Observations

Six patients with post-traumatic headache complained of photophobia and of seeing "bright flashes" of light with sudden exacerbations of the headache. Also, 2 of these patients reported an intensification of light with photophobia during vertigo.

Series 7

In 6 patients and 6 normal subjects it was possible to induce experimentally a sudden intensification of light or "bright flash" and photophobia by deep

painful pressure upon the soft structures of the occiput and neck. Such bright flashes were experimentally induced in the 6 patients with post-traumatic headache by sudden painful movements of the head and neck. The induction of deep analgesia of the soft structures of the occiput and neck by the injection of 1% procaine hydrochloride made impossible experimental reproduction of headache and scotomata.

Comment

Various types of scotomata have different mechanisms. Thus, scotomata associated with migraine headache are the result of vasoconstriction and ischemia usually within the cerebral cortex and sometimes possibly also in the retina. They characteristically precede the onset of headache but sometimes persist during the first part of the headache. Also, scotomata sometimes usher in a major epileptic seizure. Occipital lobe tumors may give rise to such visual disturbances. It is possible that the scotomata which are associated with a severe blow on the head result directly from cortical stimulation or damage. Still another mechanism is manifest in the sudden displacement of the eyeball by a blow, very much as when one rubs or presses upon the eyes. This causes the retina and possibly the optic nerve itself to be mechanically stimulated.

Although ischemia within the cerebral cortex, direct cortical stimulation or damage, or mechanical irritation of the retina or the optic nerve may produce scotomata, another explanation for the intensification of light associated with post-traumatic headache seems more relevant. Thus, in experiments described elsewhere (23) it has been shown that pain suddenly induced about the head may cause the subject to report that a constant light source appears brighter than before the onset of pain. It is inferred that a spread of excitation associated with a sudden high intensity pain in the head may cause the subject to report a sudden flash of light. This would appear to be the explanation of seeing bright lights or "stars" with the precipitation of a painful muscle cramp or with painful pressure on a tender muscle in patients with headaches of Type 1 and 2.

The Mechanism of Vertigo which Accompanies Post-Traumatic Headache

Observations

Series 8

Observations were made on 6 patients with post-traumatic headache who had sudden exacerbation

of pain accompanied by vertigo when they lifted their heads from the prone to the upright position. Vertigo was experimentally induced in these subjects, when they were lying on a bed in the prone position, by painful pressure upon tender regions in the deep tissues at the base of the skull and behind the ear. Sometimes the vertigo could be induced by stimulating with traction or pressure within the external auditory meatus. Two patients reported, during attacks of vertigo, intensification of light with photophobia. The induction of deep analgesia by the injection of 1% procaine hydrochloride into deep tender areas of muscle at the base of the skull and behind the ear eliminated pain and "giddiness" and made their experimental reproduction impossible.

Comment

Vertigo as an accompaniment of head pain or post-traumatic headache probably does not stem from derangements within the semi-circular canals. To explain such vertigo it is unnecessary to assume damage to the eighth cranial nerve or brain stem, or fundamental derangements in brain stem circulation. It is probable that noxious impulses arising within muscles and their attachments cause a widespread excitation of the brain stem near the vestibular nuclei and thus produce the vertigo.

Campbell and Parsons (2) experimentally induced head pain by injecting hypertonic salt solution into the scalp and neck. The pain was accompanied by giddiness, listing, pallor, sweating, nausea, and pulse changes. They, too, considered that these phenomena arose through spread of excitation among the cranial nerve nuclei and association tracts of the upper cervical cord and the brain stem. They also recognized that pain stimuli arising in the periosteum, ligaments, connective tissue, blood vessels, and muscles of the upper cervical region could give rise to vigorous and sustained muscular contraction which augmented the original pain. They were able to eliminate both the local pain at the site of the experimental lesion in the neck and the referred pain about the head by procaine infiltration of the primary source of noxious stimulation.

Friedman and his co-workers (5) found that 51% of 102 patients with head injury complained of dizziness or vertigo at some time after the injury. It was intermittent and of variable severity, duration and frequency. Change in posture was the most common precipitating factor. There was little evidence that post-traumatic dizziness was related to damage to the vestibular end-organ.

Brain Damage and Headache

It may not be inferred that because a patient gives evidence of brain damage, such as motility and sensory disturbances, defects in mentation, or grossly abnormal pneumo- or electroencephalograms or operative visualization that any associated headache is due to brain injury. In fact, in the New York Hospital patients, no relation existed between the presence or absence of such abnormalities and chronic post-traumatic headache. This is in accord with the inference of Friedman and Merritt (6) who found no correlation between the occurrence of headache and the severity of the injury as shown by the spinal fluid pressure or the presence of blood in the spinal fluid; and supports the opinion expressed by Brenner *et al.* that "it is doubtful if the degree of brain or meningeal injury is of significance in the genesis of the headache. Headache is related in some way to the fact of injury, not to any given feature of pathology demonstrable by the methods used."

The New York Hospital series was limited to those who developed headache following head injury, and no statistical study on the incidence of headache in those who had head injury was made. Therefore, no exception can be taken to the statement of Brenner *et al.* (1) that "the incidence of headache was low in those who had no disturbance in consciousness or were only dazed as a result of the injury." However, it is necessary to emphasize that of the 63 patients in the New York Hospital series, 12 with serious post-traumatic headache had never been unconscious as a result of their head injury.

Also, Brenner *et al.* found no correlation between the duration of coma, disorientation or amnesia, and the incidence of post-traumatic headache. But they found the incidence of prolonged headache significantly high in patients who had a scalp laceration. There was no correlation between the incidence of prolonged headache, reflex changes, increased spinal fluid pressure, presence of blood in the spinal fluid, skull fracture, duration of hospital stay, or generalized electroencephalographic anomalies during the first week after the injury. There was close correlation between the duration of dizziness and the duration of headache. They found "a strikingly low incidence of prolonged headache in the group of recreational accidents, a suggestively low incidence among domestic accidents and a suggestively high incidence among industrial accidents."

THE INCIDENCE OF PSYCHONEUROSES IN PATIENTS WITH CHRONIC POST-TRAUMATIC HEADACHE

According to Brenner *et al.*, the incidence of headache lasting longer than two months after injury was significantly high in those patients who were psychoneurotic prior to the accident; in those patients who without disturbance of consciousness were restless, excitable, apathetic, or particularly disturbed emotionally during the first week after the injury; in those patients who, after discharge, complained of fears, anxieties, fatigability, irritability, or concentration difficulties; and in those with unfavorable life situations, especially occupational difficulties and pending litigation.

The patients were examined to ascertain the presence of intellectual defect and psychoneurotic disturbance by means of interview, the Shipley-Hartford Retreat Scale for Measuring Intellectual Impairment (17) and the Cornell Service Index.

Two-thirds of the patients were found to have some degree of intellectual impairment, and one-seventh were considered to have serious impairment of intellectual function.

As a result of the interview and the Cornell Service Index, Form S, which is intended to aid in the screening of "persons with neuropsychiatric or psychosomatic disturbance," it was revealed that two-fifths of the patients had serious disturbance. An additional one-third had a moderate personality disturbance. Thus, almost three-quarters of the patients had anxiety feelings, concomitant bodily disturbances and hypochondriasis as outstanding features. About four-fifths of the patients were psychoneurotic before they sustained head injury. Nearly one-half of the 37 subjects on whom data were available had a parent, usually the mother, who suffered from headache, and in addition almost one-third had evidence of neurosis or psychosis in some member of the family.

FORMULATION AND SUMMARY

(1) It is likely that with the exception of those headaches associated with post-traumatic subdural hematomata and subarachnoid hemorrhages, the chronic headache following trauma to the head results mainly from noxious stimuli originating on the outside of the skull.

(2) Such headaches result from sustained contraction of the skeletal muscle of the head and neck associated with the occurrence of sustained resentment, anxiety, frustration, tension, and fear, and are sometimes augmented by noxious stimuli arising from abnormal healing and scar formation

within these extracranial soft structures of the head and neck. In many instances the amount of muscle contraction is minimal and probably is the basis of complaint because it is sustained and because of an abnormal preoccupation with the head. Since all of the patients in this study gave evidence of emotional disturbance, it is likely that they over-react to minimal head sensations which would otherwise be disregarded.

(3) In a small proportion of patients with post-traumatic headache, distended cranial vessels are the source of noxious stimuli which give rise to the headache. Such headaches resemble migraine headaches in quality, mechanism and response to ergotamine tartrate.

(4) Vertigo, listing, pallor, sweating, nausea, and pulse changes which accompanied the post-traumatic headache and which were induced by sudden change in position or movement of the head were experimentally reproduced and studied. It is inferred that they were the effects of spread of excitation within the brain stem resulting from noxious stimuli arising in the skeletal muscle and their attachments at the base of the skull. Scotomata, associated with post-traumatic headache, were also experimentally reproduced and studied, and are considered to be due to spread of excitation within the cerebral cortex, secondary to noxious stimuli arising in skeletal muscle about the head.

(5) Chronic headaches, which follow trauma to the head, closely resemble, as regards the basic patho-physiological mechanisms and symptomatology, other headaches which accompany and follow stress and untoward life situations but which are unrelated to head trauma.

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APPENDIX A

THE PSYCHODYNAMICS OF POST-TRAUMATIC HEADACHE

So important do symbolic factors of, and aside from, the injury itself become to a patient with head trauma that their appraisal is necessary for a proper interpretation of the post-traumatic headache syndrome. The head has special symbolic significance in that injury of this part may do far more injury to the individual than the local tissue damage would, on superficial consideration, appear to justify. This topic, with an adequate bibliography, has been recently reviewed by Kozol (4) and by Adler (1).

To most anxious persons, the use of the head, the "wits," the ability to be ever on the alert, to apprehend danger and lurking forces of destruction are the very basis of such meager security as they possess. To have an accident occur which involves the organ of these defenses is terrifying. The following observations were made on the group of patients with chronic, recurrent post-traumatic headache, who were also studied* to ascertain the mechanism of their headaches. The differences between civilian and military patients were not significant enough to justify special classification of data. The observations are presented for simplicity and directness in narrative form.

OBSERVATIONS

Anxiety

Anxiety about the implications of the accident—whether or not the brain was damaged, whether or not late or secondary sequelae will occur, whether or not the "nervous system" would "stand the strain" of future effort, concentration and stress caused a sustained state of tension and fear.

Also, head injury took on special significance when the accident occurred during periods of dissatisfaction, feelings of defeat, despair, or hopelessness. When the striving, the struggle of competition, the effort to get ahead, or "to keep one's head above water" appeared to the individual to be increasingly difficult, or his energy to be diminishing, the head injury came as a final blow of ill fortune, and then, convinced of defeat, the patient felt hopeless and depressed.

When, on the other hand, the accident occurred in a setting of relative "success" and "achievement" in an individual who required constant evidence of new achievement to be secure, similar anxiety occurred. Under those circumstances, because of

imposed inactivity or the restricting admonitions of a cautious, oversolicitous physician, such patients felt blocked, caught or frustrated, and in danger of falling hopelessly behind.

The headache was usually but part of a widespread response. Thus, when the accident occurred in a setting of horror, bloodshed and catastrophe, as was the case with some soldiers and sailors, the patient experienced long-lasting trembling, nightmares, exaggerated startle reaction, sweating, restlessness, and weeping. When the accident situation was less disturbing, these symptoms were less prominent (1).

Assertive Masculinity in Competitive Society

Some of the male patients were unusually aware of the high value put upon competitive effort in our society and yet, despite the struggle, up until the time of accident they had voiced no complaint. Sometimes they did not realize the stress under which they operated and accepted their striving and effort as an inevitable aspect of life which all were expected to suffer uncomplainingly. Hence they were not considered "neurotic" persons and many prided themselves on their unfailing health and ability to "take it." In such persons, the head injury brought underlying anxiety to the surface.

Humiliation, Guilt and Defeatism

In a few, the accident came as a humiliating experience. Individuals with pride in their strength, vigor, ability to manage, thus "floored" by faulty driving, carelessness in crossing the street, awkwardness in falling, or being in the way of a falling object, were brought face to face with their fallibility and frailty. Another aspect of such insecurity was voiced by military personnel, who feared their "luck was gone" or their "number was up." To be brought forcibly into the class of the sick, the invalid, to be brought down to the "average" of humanity by a blow to the "master organ," coupled with the realization that the individual did not fully control the reins that determined his directions, was frightening, demoralizing and humiliating. In some of the military personnel, feelings of guilt entered into the production and prolongation of the psychoneurotic tension state. Several of the men were the sole survivors of an explosion which had killed everyone else in their unit. In recounting this event, all the men behaved in a peculiar, subdued, guilty manner. Feelings of guilt accompanied

* See studies.

the thought, "I'm glad they were killed instead of me."

Conflict in Conscientious, Passive Persons

Conflict was often violent in the anxious, conscientious, passive soldier or sailor patient who dreaded battle and the danger or brutality of war and yet felt the need to take his part in the great movements of his society. To him a blow on the head created further conflict, since with his drive for self-preservation the head blow had come as a warning of further or fatal blows. It refreshed his fear of destruction and death, yet diminished not at all his need to win approval from the group by participation in its dangers and the sharing of its risks. The conflict of these two pulls produced a tension state with many features of depression.

Conflict Concerning Compensation

Also "compensation" in all its forms, either freedom from exposure to further danger, freedom from struggle of competitive effort or release from financial insecurity brought conflict with it. The victory or release was only superficial. Beneath the external calm the struggle continued. The loss of self-esteem, the debasement, the defeat, the affirmation of inadequacy now openly proclaimed continued to disturb the individual.

Compensation and Resentment

Another important aspect of the compensation factor in headache resulting from head injury was

the development of resentment, associated with feelings of being unjustly treated, scorned or despised. The delays, postponements, hearings, and accusations of falsification of opposing legal experts stirred up the already existing conflict. Because of the rôle accorded money as a symbol of reward, the belief that he had been deprived of suitable compensation aroused in some patients a conviction of being cheated or exploited. Such misinterpretation led to accumulating resentment and tension. For example, the employer of one patient, following the latter's head injury, aimed to give him work which was less exacting, required less responsibility and allowed him greater opportunity for relaxation. The patient, misinterpreting the arrangements, developed severe persistent headaches, became depressed, lost his drive and enthusiasm, and offered his resignation.

Formulation

Danger of threats to the integrity of the head because of the implications concerning "brain," "initiative," "alertness," and "intelligence" in our society, jeopardized the security of the moderately insecure, and seriously undermined the poorly adjusted. The associated reactions of anxiety, resentment, fear, feelings of being caught, despair, depression, frustration, and prostration were accompanied by bodily changes in skeletal muscles and blood vessels that resulted in headache. The occurrence of the headache aroused fresh anxiety and convictions of impending catastrophe. The vicious cycle thus established often continued for an indefinite period.

APPENDIX B

PREVENTION AND MANAGEMENT OF CHRONIC POST-TRAUMATIC HEADACHE

To reduce the incidence of headache and the number and seriousness of other sequelae following head injury, it was formerly considered good practice to keep such patients in bed for many weeks after the accident. Eight to ten weeks of complete immobilization, "flat in bed," was not unusual. In retrospect it seems likely that such prolonged bed rest produced many sequelae.

The Second World War, in renewing interest in manpower and in shortening convalescence, caused this attitude to be challenged. Patients were urged to get out of bed as soon as they "desired" and were pressed into active service within two to three weeks of the period of injury, assuming that mentation was not so disturbed as to impair military effectiveness. Tönnis (8), McKenzie (5), Spurling (7), White

(9), and Shearburn and Mulford (6) have observed that after such accelerated convalescence the usual sequelae of head injury were reduced or absent. This has been attributed in good part to the attitude of the physician who, in minimizing the significance of the head injury by getting the patient out of bed and urging him to take part in the ward routine, eliminated the unexpressed fears of the patient and convinced him as would no spoken word that the damage done had been insignificant.

If, on the other hand, after the accident the physician imposes long bed-rest, is anxious about pain, vertigo and lightheadedness; if he creates an atmosphere of uncertainty or impending catastrophe by his own doubts and anxiety, then these, too, are perceived and taken on as his own by the patient.

Akin to the anxious physician in his danger to the patient with head injury is the lawyer or advisor who, because of excessive caution or unscrupulousness, suggests that the head injury may be crippling or be followed by evil effects. Such persons may present the possibilities of subdural hematoma, brain abscess, convulsions, or other late sequelae of head injury, thus postponing legal and financial settlement and blocking the patient's return to work and domestic responsibilities.

Compensation conflicts should be quickly resolved by explanation of the dynamic factors involved; all financial arrangements settled, and court and other legal procedures promptly terminated. If this cannot be achieved, if court or other legal procedures are left pending, the symptoms, including headache, may be indefinitely prolonged. It is highly important that the patient understand his motivation in seeking compensation, and its cost to him in the creation and prolongation of his symptoms. Thus, a quickly settled, lesser reward is preferable to a higher one gained at the cost of prolonged litigation. In all events, whether adjusted early or late, in or out of court, the financial settlement should be fixed and final. Compensation must not be given for an indefinite period or until such future time as the prognosis is ascertained.

In the management of the post-traumatic headache, Jones and Brown (3) are of the opinion that the injection of procaine hydrochloride into tender muscles is a valuable therapeutic device. There is little danger in the use of this method if the injections are not made near the foramen magnum and atlas. It has also been observed at the New York Hospital that such procaine injections into the soft tissue of the painful area sometimes give temporary or long-lasting reduction in the intensity of headache. However, if such sustained local tenderness and steady aching headache have persisted for longer than six months, the likelihood of elimination by procaine injection is slight. Moreover, injections in this region have caused serious accidents. One patient so treated in the New York Hospital gave evidence of a brain stem lesion. Therefore, dramatic though the beneficial effects of the procaine injection procedure may sometimes be, the same end result can be achieved by the less painful and less dangerous procedures of massage and heat.

As mentioned above, occasionally the patient has, in addition to the steady, sustained headache, a pulsating headache which is strikingly reduced in intensity or eliminated by ergotamine tartrate given intramuscularly in 0.5 mg. amounts.

But by far the most important component of the management is the consideration of the entire reaction to the head injury (2). Of prime importance is the recognition of a serious depression precipitated, or accentuated by, the head injury. Failure to make a diagnosis and evaluate this mood disorder may be followed by death through suicide.

Occasionally it is sufficient for a competent and respected physician to assure the patient that no major damage has been done, and even though discomfort or pain exist they do not mean irreversible defects. Also, for the physician to emphasize that the examination reveals that no serious sequelae will follow has important and constructive influence. These reassurances and interpretations often allay the anxiety of the patient so that his head sensations assume dwindling significance. Explanation of what it is that hurts, how the vertigo occurs and something about the other body symptoms strengthen this formulation. Probably the most important reassurance is the attitude of the physician who early gets his patient with head injury out of bed and minimizes the significance of his symptoms.

An evaluation of the setting in which the accident occurred is very important. An appraisal of pre-accident feelings such as anxiety, resentment, frustration, despair; a review of the entire life situation, and the place of the accident in this setting, when understood by the patient, may make a basic difference in his attitude, emotional state and bodily symptoms.

The prognosis for long-standing, post-traumatic headache cannot be expressed in general terms, since much depends on the rapport between patient and physician. If the individual's history previous to the accident demonstrated long-standing and serious maladjustment, the prognosis is grave.

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TRAVEL NOTE

During the months of March and April your managing editor visited England, France, Holland, Denmark, and Sweden. First-hand information was gathered as to developments of psychosomatic research and possibilities for distribution of our psychosomatic publications abroad.

Since 1939—the year in which the journal, *PSYCHOSOMATIC MEDICINE*, was first published—European medical men, except in the case of a few individual instances, have done little psychosomatic research *per se*, many of them have never heard the term, and they have had no funds or facilities for obtaining scientific publications.

There is no doubt, however, of the great interest abroad in psychosomatic medicine. There was, for example, an almost pathetic eagerness on the part of a large group of medical students to scan the single remaining copy of the *Journal* taken to the Queen Wilhelmina Hospital of the University of Amsterdam.

The rebuilding of medical libraries is of primary importance, as indicated by a recent article in the *British Medical Journal*, which quotes Dr. W. M. Goodman, Medical Director of UNRRA, as saying that European doctors, when asked what they most needed, replied, "To be brought up to date . . . a Polish doctor was able to keep his records and textbooks, but only by taking seven trips through the German lines. . . ."

A NEW PSYCHIATRIC RATING SCALE

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I. CHARLES KAUFMAN, M.D.***

One of the fundamental aspects of present day research in psychiatry is the emphasis that is placed on a multi-dimensional approach in the study of personality disturbance. Laboratory investigations of a physiological, biochemical and psychological nature are carried out concurrently with clinical observations of the nature of the disease and changes that occur in its course. It is quite obvious, however, that a mere compilation of such data will be worthless unless the results of both laboratory and clinical findings can be expressed in a manner that will permit adequate correlation and uniform standards of measurement. The current "essay" form of describing the clinical picture, useful as it may be in the description of the patient as a whole, does not lend itself adequately to quantitative correlation with the laboratory data. This does not mean that personality functions necessarily have inherent properties that do not permit quantitative evaluation. The daily observations of patients, particularly those under treatment, frequently present recessions or exacerbations of symptoms which can be expressed in terms of greater and lesser degrees of severity of the disease. In actual practice these observations are used as guides in evaluating the progress of the patient's condition and the likelihood of his being able to adjust in the community. There is no reason, therefore, why this material cannot be expressed in a form which will permit adequate correlation with changes in physiological and biochemical processes. For this purpose it is essential to abstract from the whole clinical picture a certain number of functions that are relevant to the particular disturbance and which, at the same time, can be observed to fluctuate in degree. An aggregation of such functions could form a psychiatric scale which could be used in correlating clinical and laboratory data. In the present communication we wish to describe our experiences with such a rating scale and consider its statistical validity as a measuring instrument. In a following paper we shall apply this scale to a study of patients whose clinical condition is favorably influenced by electro-shock therapy and

attempt to correlate the psychiatric measures with changes in the electroencephalogram and of some of the endocrine functions.

This scale consists of 20 items which were chosen primarily for two reasons: (a) Items in which the degree of variation from the average or normal is meaningful in regard to the seriousness of the mental disturbance; (b) Items which can be observed and evaluated equally well by independent observers. In the following table (see Table I) we present these functions and the various deviations from the normal in qualitative descriptive terms. As will be seen from an examination of the functions listed, they fall into three groups: first, those that can be obtained by observation during an interview; second, those that can be obtained through communication with the patient during the interview; and third, those aspects of behavior that must be observed by the ward personnel over a twenty-four hour period. In each one of these we have five possible characteristics, described in commonly used terms and marked A, B, C, D, and E, respectively. C represents that degree of each function which is generally accepted as the normal behavior of the average person. Obviously we must take into consideration the type of person we are dealing with and what was considered as his own "normal" level of behavior as obtained from an adequate history. The terms listed to the left of C and placed in columns B and A are deviations to the one side of the normal with B being the less severe and A the more severe. D and E represent deviations in the opposite direction (see Table I), similarly graded according to their severity.

These qualitative ratings may be made quantitative by assigning numerical values to each successive deviation from the average. C can thus be considered as zero. B and D, each one unit from C, are equal to one. A or E, each 2 units from C, are each equal to 2. Where the deviation is not marked enough to be placed in any one of these categories a plus or minus sign may accompany either of the letters and these would be equal to one-half a point. All numerical values are positive and express the distance of the letter value from the normal condition C. It should be noted that in computing the values the deviations either to the right or the left are considered as of equal pathological importance.

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TABLE 1

Function	A	B	C	D	E
Appearance.....	Decorative	Over-scrupulous	Average	Slovenly	Untidy
Activity.....	Excited	Agitated or hyperactive	Average	Retarded	Stuporous
Responsiveness.....	Over-dependent	Suggestible	Average	Stubborn	Resistive or negativistic
Direction.....	Presses for contact	Spontaneous	Average	Poor contact	Self-absorbed or withdrawn
Receptivity.....	Excitable	Irritable	Alert	Dull	Lethargic
Attention.....	Scattered	Distractible	Average	Difficult to gain	Inattentive
Consciousness.....	Confused	Disoriented	Average awareness	Cloudy	Coma
Speech.....	Push	Over-talkative	Average	Retarded	Mute
Association.....	Flight	Increased scope	Average	Poverty	Blocking
Memory.....	Confabulatory	Hyperamnesic	Average	Defective	Amnesic
Judgment.....	Irrelevant	Snap (superficial)	Average	Hesitant	Unable to decide
Social.....	Meddlesome	Out-reaching	Average	Asocial	Antagonistic
Complex.....	Assaultive or destructive	Compulsive or impulsive	None	Self-mutilation	Suicidal
Sexual.....	Exhibitionistic	Erotic	No overt	Homosexual	Open masturbation
Mood.....	Exhilarated	Euphoric	Average	Depressed	Apathetic
Emotion.....	Explosive	Labile	Average	Retarded	Inappropriate
Autism.....	Projections	Day dreams	None	Guilt and inferiority	Nihilistic
Nutritive.....	Omniphagea	Voracious	Average	Anorexia	Refusal
Sleep.....	Reversed rhythm	Insomnia	Average	Somnolence	Continued sleep
Occupational record	Zealous	Enthusiastic	Average	Disinterest	No work

Thus B— or C+ are equal to one-half each. Similarly with C+ or D—. Similarly D+ or E— may be considered each equal to one and one-half. Each of the 20 categories has a maximum weight of 2 and thus the whole scale has a maximum score of 40 points. A person rated C in all 20 categories has a zero score at the time of the rating and one having all A's or all E's has a rating of 40.

To test the communicability and reproducibility of the scale, three psychiatrists rated 20 patients at the Worcester State Hospital* suffering from various types of psychoses. Each patient was examined by the three at the same time and the ratings were separately and independently tabulated as letter scores and were subsequently converted to numbers. Since this procedure was carried on primarily to test the validity of the scale in regard to psychiatric observation, we left out the three functions, namely sleep, nutrition and the occupational record, since the evaluation of these would have to be obtained from the nurses and obviously would be the same for each of the three psychiatrists. The maximum possible score for any one patient, therefore, was 34.

Table 2 shows the results of these ratings and figure 1 shows a plot of the data. It is to be noted that Dr. M. correlates with Dr. F. so as to give a

correlation coefficient of 0.907, $P < 0.01$, and Dr. M. correlates with Dr. K. yielding $r = 0.868$, $P < 0.01$.

TABLE 2

Patients	Scores			
	Dr. M.	Dr. F.	Dr. K.	Means
A. T.....	15.5	10.0	12.0	12.5
E. T.....	20.5	15.5	16.5	17.5
W. S.....	17.0	16.0	22.5	18.5
C. D.....	11.5	10.0	12.0	11.2
J. S.....	9.5	11.0	11.5	10.6
W. E.....	15.5	10.8	15.0	13.5
A. V.....	13.0	8.0	8.5	9.8
H. L.....	17.5	15.5	15.5	16.2
C. E.....	18.5	14.5	19.5	17.5
E. S.....	20.5	17.0	16.0	17.8
T. B.....	12.0	14.0	16.5	14.2
G. C.....	12.5	13.0	12.5	12.6
D. K.....	19.5	14.0	13.0	15.5
J. B.....	2.0	2.0	0.0	1.3
D. M.....	19.0	15.5	16.5	17.0
D. C.....	4.5	3.0	2.5	3.3
L. C.....	3.0	4.5	4.0	3.8
A. D.....	21.5	16.0	18.5	18.6
E. B.....	11.0	11.0	10.5	10.6
W. D.....	18.5	14.5	17.5	16.8
Means.....	14.12	11.75	13.02	

The reproducibility of these ratings by persons other than trained psychiatrists is also of interest. Figure 2 shows data comparing the ratings of Dr. K. with those of three nurses who were trained to

* We wish to express our thanks to Dr. A. Finesinger for his cooperation in estimating the psychiatric states of some of the patients used in our investigation.

use the ratings and who alternated with each other in daily ratings of patients. It must be mentioned here that these observations were taken at different times of the day and therefore would be expected to show more variation than is noted in the comparison of the ratings by the psychiatrists. Four patients suffering from involutional melancholia

COMMENTS

It must be emphasized, first of all, that daily ratings of this type are not intended to take the place of the ordinary clinical notes. Looking at these ratings on any particular day or following them during the progress of the observation one certainly cannot get a complete picture of the patient functioning as a whole personality. At the same time, however, these symptoms do represent the most important clinical indicators of the severity of the disturbance and are actually used by the staff of psychiatrists in the determination of cessation or resumption of treatment, placing the patient at various types of occupations in the hospital, or deciding when a patient is ready to be rehabilitated in the community. It is also true that an electroencephalogram does not tell us all about the overall physiology of the central nervous system, nor does a blood sugar, for instance, tell us the whole story of the biochemical functions of the person. Both the rating scale, therefore, and any given set of physiological or biochemical data are fragmentary and can only be used as indicators of the disturbed functions and not as representing the whole picture of that disturbance. If, however, correlations between these two can be obtained, then the laboratory data gain a meaning relevant to the clinical picture at that particular time.

SUMMARY

1. Qualitative letter grade ratings in terms of 20 items symptomatic of the psychiatric status of the patients are described.
2. These ratings may be converted to a numerical scale running from zero for well persons to 40 units in cases of extreme mental illness.
3. Three different psychiatrists, independently rating each of 20 patients on the same occasion, show correlation coefficients as follows:

Scores for M. and F., $r = 0.907$, $P < 0.01$.

Scores for M. and K., $r = 0.868$, $P < 0.01$.

4. Instructed nurses can use this scale so as to give meaningful rating evaluations of a psychiatric status that parallel the ratings of a psychiatrist.

5. Our data indicate that the ratings are sufficiently communicable and reproducible to make the scale a serviceable tool in psychosomatic studies of the patient's condition.

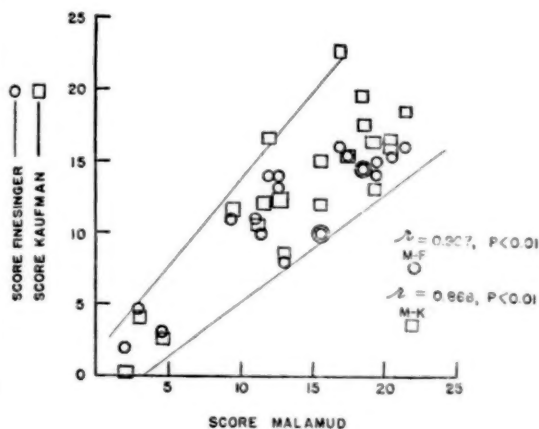


FIG. 1

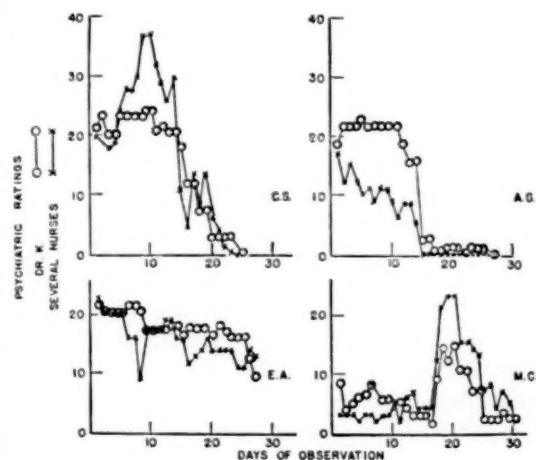


FIG. 2

were studied over a period of days as indicated in figure 2 and all 20 of the items were used. Two of the patients, C.S. and A.G., show marked improvement during the period of observation as a result of electro-shock therapy. It may be seen that the psychiatrists' daily ratings and those by the nurses follow the same general trend although the correlation is not as high as found in Table 2 and figure 1.

CHANGES IN THE ELECTROENCEPHALOGRAM AND IN THE EXCRETION OF 17-KETOSTEROIDS ACCOMPANYING ELECTRO-SHOCK THERAPY OF AGITATED DEPRESSION

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INTRODUCTION

In a previous paper (6) we have described a psychiatric rating scale which affords a method of recording changes in the clinical picture in terms which can be satisfactorily used in correlating clinical and laboratory data. It was found that three psychiatrists, independently rating each of 20 patients who were interviewed by all three at the same time, showed good correlation in scores, *i.e.*, Dr. M. correlated with Dr. F. with an r value of 0.905, $P < 0.01$, and Dr. M. correlated with Dr. K. with an r value of 0.868, $P < 0.01$.

In the present paper we shall report studies of a series of female patients suffering from agitated depressions. These women were all given convulsant electro-shock therapy twice a week for eight to fifteen treatments and were rated from day to day on our psychiatric scale before, during and after the period of treatments. Electroencephalograms were taken twice a week for some time prior to the treatments, for the treatment periods and for post-treatment periods lasting for some weeks. During the pre-treatment, treatment and post-treatment periods we also collected urine specimens which were analyzed for 17-ketosteroid content. We have thus followed in the same individuals psychiatric and physiological variables from stages of acute mental illness to good remission.

Several investigators have found changes in the E.E.G. accompanying electro-shock treatments. Barrera and Pacella (1) have reported the occurrence of waves of 3-6 per second in some patients following shock and these slow waves may persist for weeks into the post-treatment period. They report that there is no definite relationship between success or failure of the therapy, either with the occurrence or absence of these waves or with their post-treatment persistence. In a later paper (7) Pacella, Barrera and Kalinowsky report more exten-

sively on the E.E.G.'s of 61 mental patients who were given from 6 to 22 electro-shock treatments. From this work it is clear that the occurrence of slow delta waves in some patients bears no relation to the success of the treatment. Proctor and Goodwin (10), however, have reported that those patients who develop an excessive amount of delta wave activity after the third or fourth treatment are only slightly or transiently improved by the full course of shock therapy, and in a subsequent paper (9) these authors found that the widespread appearance of slow waves towards the completion of a shock series is usually associated either with little or no clinical improvement or with clinical reversal.

In some of our patients we also found marked slowing of brain wave frequencies in the 3 to 12 range after several treatments. This slowing may be very conspicuous, with the peak of the frequency spectrum shifting from waves of 10 per second to those of 4 or 5 per second and with an amplitude of 100 or more microvolts. In other patients who psychiatrically may be either better or worse than those showing this slowing, the major peak of the spectrum may not shift at all after a series of twelve treatments. We found no correlation whatever between these gross and dramatic changes in the E.E.G. or the recovery therefrom in subsequent weeks, and the efficacy of the treatment.

We did, however, find a striking parallelism between the clinical state of the patient as measured by the psychiatric ratings and a particular aspect of the brain wave frequencies, and this we wish to describe. In brief, we found that frequencies of 14 per second and greater correlated remarkably well with the psychiatric condition of the patient in that her improvement during the period of treatment was uniformly accompanied by a decrease in these fast frequencies.

In this connection it is of interest that Greenblatt (5) has reported a high incidence of fast activity in the E.E.G.'s of involutional psychotics although he believes that the age factor may be important here since slow abnormalities are more characteristic of the early years of life and fast abnormalities of later

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years. Finley (3) reports that 50-75% of involuntional patients show > 15 per second activity in contrast to 3-8% of normals judged by the same criterion. While some normal persons also thus show considerable fast activity, we were impressed to find that 9 of our 13 involuntional patients showed > 13 per second activity during 20% or more of the time of their records. We should expect to find fast activity of this degree in not more than 10% of the normal population.

We were interested in the output of urinary steroids in this series because work (4) by our group indicates that the excretion of 17-ketosteroids by psychotic patients is different from that of normal persons. While the total output of 17-ketosteroids per twenty-four hours may be the same in both groups, normal persons show a marked diurnal rhythm of excretion which psychotics frequently lack. On rising in the morning the normal man or woman increases the output of 17-ketosteroids some 60% over the night level and this enhanced excretion rate declines during the day. Psychotic patients (primarily schizophrenic patients have been studied) usually do not show this morning increase; the night rate in mgm. per hour if divided into the morning rate tends to be approximately 1.00 instead of 1.60 as for most non-psychotic persons.

Since electric shock influences the psychiatric state of the patients we felt it would be especially interesting to see if our patients showed a low ratio of morning to night values of 17-ketosteroid excretion and, if such abnormalities occurred, whether the ratios would be normalized by shock therapy.

MATERIAL AND PROCEDURE

Thirteen patients, all women, were used in this study. Clinically all of them showed primarily agitated depression. Eleven of the patients were diagnosed involuntional psychosis (7 melancholia, 2 paranoid and 2 other types). The other two patients were undiagnosed psychoses, the main feature in their personality disturbance being agitated depression with feelings of guilt and anxiety. The age range was between 29 and 53 with most of them in the middle forties. None of the patients had had any psychotic episodes prior to the onset of the present disturbance. In addition to the usual psychiatric study and follow up, each one of these patients was systematically rated by the previously mentioned psychiatric scale throughout the period of this study before, during and after electro-shock treatment. These ratings were undertaken at least three times a week, and in a number of instances daily ratings are available. At the end of the study

the results of the ratings were charted in correlation with the laboratory findings.

Electroencephalographic ratings: A three-channel Grass electroencephalograph recorded brain waves on each of our patients twice a week before, during and after the shock series. Metal pellet electrodes attached to the scalp with collodion were used. In all but 2 cases not fewer than two records were obtained prior to shock treatment and E.E.G.'s were usually taken for some weeks after termination of the shock series. The E.E.G.'s were never taken on the day of treatment, but always at least twenty-four hours later. The records were obtained from reclining patients with their eyes closed. Both monopolar and bipolar recordings were obtained routinely from right and left frontal parietal and occipital areas, but for purposes of final quantitative analysis we have confined our attention solely to bipolar (push-pull) occipital records since these are most free from muscle action-potentials and other artefacts. This precaution we feel is especially important since we have found frequencies of > 13 per second to be the most interesting and these may be confused with muscle artefacts more easily than the slower potential changes.

The records were analyzed by a modified method described by Brazier and Finesinger (2) which consists of analyzing the percentage of the time occupied by waves of each frequency in single cycles up to 14 cycles per second and plotting the percentage of the time each frequency is present against the frequency itself. Any group of two or more of regular waves, regardless of amplitude, above 13 cycles per second were plotted on the frequency chart as contributing to the "percent time > 13 per second," and time occupied by inactivity of the record or by single random waves were plotted as "percent time random activity." Our sample thus analyzed consisted in each case of 3 meters of bipolar record corresponding to 100 seconds of recording.

From our overall frequency plots we could thus see what changes, if any, occurred in specific frequencies of an individual when her psychiatric state was modified by therapy.

We wish to emphasize that the psychiatric ratings and the E.E.G. analysis were made *entirely* independently of each other. The psychiatrists did not know of the E.E.G. trends when they made their ratings and the persons analyzing the E.E.G. records had no knowledge of the psychiatrists' ratings. Comparisons were made of the data only after the completion of the series.

Determinations of 17-ketosteroid as a measure of

adrenal cortical function: Urines were collected from 10 of the 13 patients usually four times prior to shock treatment, twice a week during the weeks of shock and usually four times in the post-shock period. At each collection a night sample (bedtime to rising) was taken and a morning sample covering the time of getting up to lunch time. Each specimen was precisely timed so that the number of hours and minutes during which the urine had collected in the bladder was known since we express the 17-ketosteroid output in terms of mgm. excreted per hour. Wartime limitations of available nursing personnel and supervisors and the fact that inexperienced student nurses usually made the collections led to complications. Creatinine determinations were performed routinely on all the specimens since its constancy of excretion furnished a check on the accuracy of timing of the sample. Unfortunately, we were obliged to discard many specimens because of incorrect timing and labelling so that our series was not as complete as we had planned. From the creatinine checks we obtained 186 reliable specimens from the 10 women before, during and after the shock treatments. The 17-ketosteroid content of the urines was measured by methods previously described (8).

RESULTS

As stated above, the patients were all treated with electro-shock therapy. The treatment was administered twice weekly and each course consisted of eight to fifteen treatments. Eight of the patients received a single course each, 4 patients were given two courses each and in one patient a third course of treatment was given. The results were as follows: All the patients showed improvement directly after the conclusion of treatment. The final results in the follow-up showed good remission to recoveries in 9 patients, and no changes or even further progress of the disease in 4 patients. It is of interest to note that of the 4 patients who showed no improvement 2 were diagnosed paranoid involutional psychosis, one involutional other types, and one undiagnosed psychosis. In all 4 there were features which went beyond the usually predominant mood disturbance of the involutional melancholia.

Inspection of our plots of brain wave frequencies during the course of treatments while sometimes showing, as discussed above, dramatic post-shock slowing in the 3-12 range, at first appeared to bear no relation to the changing state of the patient. More extensive experience showed, however, that the frequencies of greater than 13 per second [what Brazier and Finesinger (2) refer to as intermediate

plus beta frequencies] did indeed vary with the psychiatric state as measured by the daily application of our rating scale.

Figure 1 shows records of 6 of the 13 patients in whom the psychiatric ratings and the percent of time of the E.E.G. occupied by the fast (> 13 per second) frequencies are plotted against the time course of the days of observation. The treatment periods are indicated by arrows. It may be seen that the two curves fluctuate together in that improvement is accompanied by a decline in the fast frequencies. For example, patient R. C. received two courses of treatments. She relapsed as indicated after the first series and improved with the second series, maintaining sufficiently fair remission so as to be allowed to leave the hospital three months later. Patient M. C. had a resurgence of psychotic symptoms during the first course of her shock treatments and accompanying this relapse there occurred a marked rise in her > 13 per second waves. Thus we see that decrease in fast waves is not related to the occurrence of shock, *per se*, but rather parallels the psychiatric state itself. This is also illustrated by patients R. C., C. Sm. and K. W., and is in contrast to the slowing (when it occurs) of the 3-12 cycle waves which in our cases bears no relation to the psychotic state, and this range of frequencies slow, if at all, in proportion only to the number of shocks. In the post-treatment relapse of M. C. the fast wave increase lags some ten days behind the psychotic relapse. This is unusual since more often the change in fast wave components occurs appreciably *before* the psychiatric change. This is especially noteworthy in the case of patient C. Sm. where the > 13 per second fall during treatment and the post-treatment rise precede by a matter of days the respective psychiatric changes.

It should be especially noted that "spontaneous" relapses and recoveries of C. Sm. and K. W. are accompanied by appropriate changes in the fast frequencies. The fast components of the E.E.G. have some tendency to return to the post-treatment periods even though the patients remain well. This is especially noteworthy in the case of F. S. and in a lesser degree with G. St. O.

Figure 2 shows plots of average ten-day values of psychiatric ratings and of the E.E.G. data for each of our 13 patients. While ten-day averaging masks some of the temporal relations shown in figure 1, it gives a clearer perspective of the overall events and brings out the correlation between fast wave components of the E.E.G. and the psychiatric state. It should be noted that the same ordinate unit is used for both E.E.G. and psychiatric ratings on this

figure instead of the 2:1 scale of these respective units in figure 1.

Because of differences in absolute levels of both variables from person to person we have not thought it profitable to determine a correlation coefficient for these experiments. The correlation of directional changes is obviously high, as may be seen from the figures, and statistical statements, *per se*, would add little not already demonstrated by figure 2.

Ten of our 13 patients were followed for changes in their output of 17-ketosteroids as described above, and Table 1 summarizes the results.

DISCUSSION

Our results indicate a high degree of relationship between the occurrence of fast frequencies in the E.E.G. and the psychiatric status of involuntal patients. At present these results are of an empirical nature. We do not know what physiological factors determine the various frequencies of the brain wave spectrum but the relationship between psychiatric states and brain physiology is challenging. The normalizing of the excretion rhythms of 17-ketosteroids with psychiatric improvement is interesting

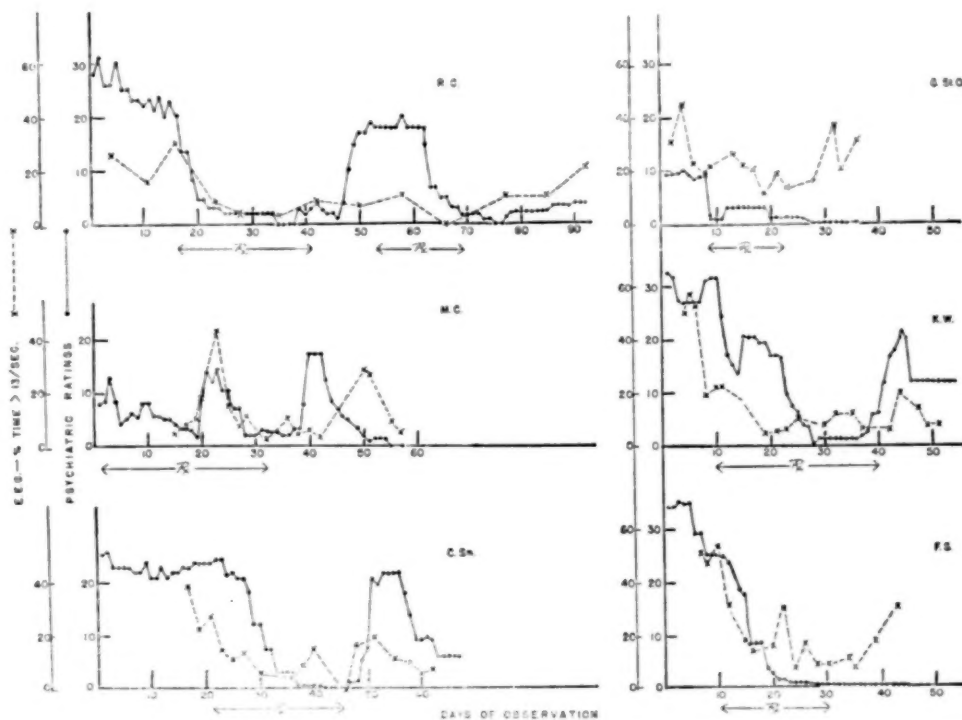


FIG. 1. Plots of data from 6 involuntal patients. Arrows cover the period during which two electric shocks per week were administered. The two ordinate scales show changes in psychiatric ratings and in the percentage of time the electroencephalogram is occupied by waves of a frequency greater than 13 per second.

Because of the difficulties in obtaining urine collections and the fact that 3 of the women, M. C., B. T. and M. S., were already on shock therapy when our observations began, we were able to obtain pre-treatment 17-ketosteroid ratios of only morning to night values on 5 of the 10 women. These values are all low compared to the mean normal value of 1.60 and range from 0.74 to 1.16. During treatment the values are seen to rise markedly and there is a slight mean tendency for the ratio to fall again in the post-treatment period over which collections were made, *i.e.*, four to six weeks after the last electric shock.

in view of our findings, reported elsewhere (4), that flat excretion rhythms are usually encountered in other types of psychotic disturbances.

This study raises more questions than it answers and perhaps that is its chief merit. Do persons in the normal population showing a preponderance of fast activity in the E.E.G. have a tendency to develop involuntal melancholia? Do those persons who show a post-treatment increase in their fast waves tend to relapse? Also, does a post-treatment decline in the 17-ketosteroid diurnal excretion rhythm mean a tendency to relapse? Our data are inadequate at present to answer these questions.

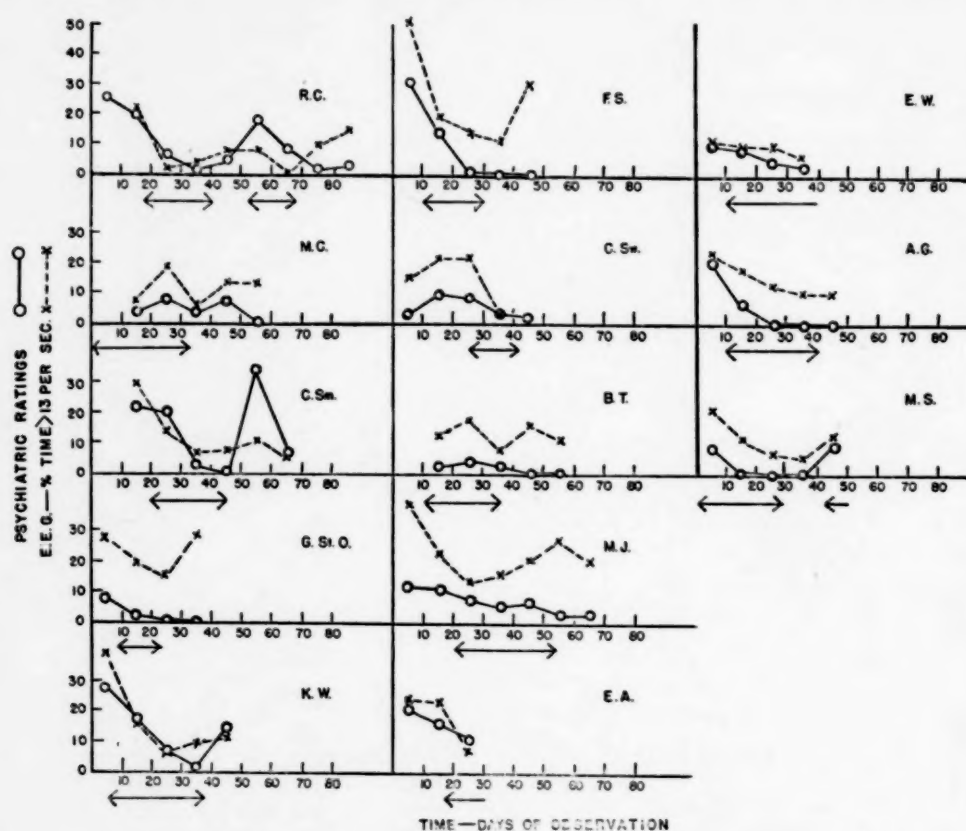


FIG. 2. Plots of data on the 13 patients showing correspondence between psychiatric ratings and the percentage of the electroencephalogram occupied by waves of a frequency greater than 13 per second. Each point is a mean of ten days' observation and averages 6 to 9 psychiatric ratings and 2-3 electroencephalographic analyses. Double arrows correspond to the treatment periods. Incomplete treatment periods (i.e., at the time the observations were stopped) in the cases of E. A., E. W. and M. S. (second shock series) are indicated by single pointed arrows. The ordinate units are on the same scale in this figure in contrast to the 2 to 1 scale of figure 1.

TABLE 1

Pts.	Diagnosis	Total No. of urine analyses	17-ketosteroid ratio $\frac{\text{Morning}}{\text{Night}}$			Status approx. 4 months after post B analyses
			Pre B	B	Post B	
M. S.....	Involitional other types	19	....	1.42	0.94	Unimproved; fluctuates with shock B
E. W.....	Invol. psych., paranoid	11	1.16	....	....	Unimproved
K. W.....	Invol. psych., other types	25	1.01	1.20	1.27	Little improved; fluctuation with shock B
C. Sm.....	Undiagnosed psychosis	13	....	1.48	1.35	Unimproved
A. G.....	Invol. psych., melancholia	24	1.04	1.39	1.10	Much improved; out of hospital
E. A.....	Invol. psych., melancholia	15	0.74	1.35	....	Much improved; out of hospital
F. S.....	Invol. psych., melancholia	15	....	0.63	1.00	Well and out of hospital
M. C.....	Invol. psych., melancholia	7	....	1.03	1.14	Fair recovery; out of hospital
B. T.....	Undiagnosed psychosis	15	....	1.77	1.64	Fair recovery; out of hospital
G. St. O...	Invol. psych., other types	25	1.14	1.61	1.53	Well and out of hospital
Means..		17	1.03	1.32	1.25	

The data in Table 1 on the condition of the patients four months after the shock treatments are too incomplete to furnish evidence one way or the other concerning this last question and we have been unable to get any of the patients back to the hospital for check-up tests.

Again it is pertinent to enquire if the diurnal excretion rhythm may not serve as an index of the desired duration and frequency of shock treatment. Would treatments be more successful if carried on until the ratio became normalized at 1.60 in all cases? And again, might it be possible to use the decrease in fast brain wave frequencies as a guide in practical therapy?

We expect to continue our observations with another group and follow them for longer times. We are also especially interested in exploring possible mechanisms relating to adrenal cortical function as reflected by 17-ketosteroid output and the frequency spectrum of the E.E.G.

SUMMARY

1. Thirteen women suffering from agitated depression have been studied before, during and after periods of eight to fifteen electro-shock treatments.

2. Daily ratings with the use of a new psychiatric scale are found to correlate well with fast (> 13 per second) frequencies in the electroencephalograms. When the patients improve, the percentage of time these waves are present decreases; when they relapse the fast waves tend to return. However, there is also a tendency for the fast waves to return in some patients showing good remission.

3. The diurnal rhythm of the nightly rate of 17-ketosteroid excretion divided into the morning rate as a measure of adrenal cortical activity was also measured. While this value for normals is 1.60, in the patients studied the mean pre-treatment value was 1.03; during the treatment period it rose to 1.32, and declined in the post-treatment period to 1.25.

4. The possible significance of these findings is discussed in terms of questions they raise for future exploration.

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THE CONCEPT OF DISEASE

C. ALBERTO SEGUIN, M.D.*

"The criterion of psychosomatic health is maintenance by the organism of homeostatic equilibrium with itself and with its environmental field."—Dunbar-Arlow

Like everything alive, medicine undergoes constant evolution. That is a well-known truth, but its consequences are often overlooked, even in connection with the most important and fundamental concepts. Among them none, perhaps, is more interesting than the concept of disease. The concept of disease has changed, of course, with the dominant conceptions of medicine in different epochs, and at present, when in our opinion medicine is passing through a decisive moment, a revision in the light of modern orientation seems necessary.

The problem has been faced in different ways, following the trend of thought of the cultural moment. Aschoff says that the history of medicine can be written by describing the attempts made to establish the *essence* of the disease. A simple definition, fitting any theory, would be: "Disease is the lack of health," but in using such a definition we have only deviated from the problem. We have now to define health.

We do not believe this to be the best way. The concept of health is a secondary one; it was born *a posteriori*, as a contrast to the notion of disease, as a negation of it. In the initial stages of the evolution of humanity, it is disease of which man first becomes aware. Later on, as a counterpart, and in a theoretical way, the notion of health was established. Before being conscious of his health, the primitive must have known that he was ill. The terms of the definition could then be changed by saying: "Health is the absence of disease."

THE CONCEPT OF DISEASE IN HISTORY

We have said the primitive was first conscious of the disease. Perhaps it was illness which, through suffering, made him acknowledge his own ego and then, following the trends of his psychology, he concretized the idea of disease, as he did with many other fundamental ideas. To the primitive, disease is a being, an exterior potency, a demon attacking the man, penetrating into him, fighting with him, dominating and killing him. This is not the moment to analyze the consequences of this idea on the diagnosis, therapy and, in general, the whole field of medicine, but we want to emphasize the fact that this primitive concept of disease, in spite

of being abandoned literally, influences the medical world even today. It was Hippocrates who first fought against this concept in his studies on epilepsy, when he stated the opinion that this disease was due to natural causes and not to any demon, but Plato thinks of the disease as something autonomous, superimposed on the organism. During the Middle Ages that idea grew immensely, backed by the mystic concept of sin as the cause of everything evil. It is easy to discover it in the belief in *demoniacs*, in *possessions*, in the descriptions of the *incubos* and *sucubos*, in the whole dark history of witchcraft and exorcisms, clouding under its black shadows several centuries of the life of humanity. It is interesting to remember that Sydenham classified diseases with the same criterium with which plants are classified in botany; as if they were entities with life of their own.

Later, all through the history of medicine, the concept of disease as an autonomous entity can be seen under different disguises, taking sometimes philosophical characteristics, as with Schonlein, who stated that life is a struggle between the individualistic and the planetarian forces. The first tries to keep its autonomy while the second tries to destroy it, incorporating the living creature in the undifferentiated totality. That "planetary force" is, as he said, the malignant potency that tries to destroy Man.

The same idea is found in the arguments about the "*sedes morborum*," the location of disease. For centuries the theoreticians of medicine discussed the place in the body in which the disease is located, as if it were a being looking for a place to settle. Morgagni was the first one to speculate about this matter, starting a discussion that continued through the centuries. It is necessary only to refer to the long opposition between "solidism" and "humorism." Some scientists, the solidists, believed that disease is located in the solid parts of the body, those who opposed that theory sustained that it was located in the humors.

Virchow reacted against these ideas, but indulged finally in them. He tried to destroy the belief in disease as something independent, but he pointed to the cell as the "location" of it, saying implicitly the very same thing he combated against.

The bacteria era followed and, with it, the Golden Age for the demoniac concept of disease. It was then possible to conciliate the irrational and primitive tendency to concretize and personalize disease with the rational, scientific thought. Here was, at last, the malignant potency. It was possible to see and to study it. The germ was the scientific form of the demon who attacks and kills.

That idea, however, could not stand against the growing knowledge of disease. It was very soon discovered that the germ was not enough to explain the whole pathologic process. The factors of environment were understood better, and it was easy to see that the organism was not passive before the "attack" of the microbe. Predisposition, immunity, resistance, etc., had to be taken into consideration.

Nevertheless, even today the primitive, demoniac concept of disease dominates medical thought. Many professional men would easily agree to the definition: "Typhoid fever is the disease produced by Eberth's bacillus," or "Tuberculosis is the disease produced by Koch's bacillus." There are writers who have expressed those ideas in the form of mathematical formulations, showing how the primitive concept of disease can be made "scientific." Strumpel, studying tabes, said the following equation can be applied:

$$K = \frac{S}{W}$$

K, the disease, is in direct relation to S, the causal lesion, and in inverse relation to W, the resistance of the organism, as if there were a struggle between an aggressor and the possibilities of defense against it.

Everyday language, reflecting the feeling of the moment, has many expressions which show us how the primitive concept of disease influences our modern ideas. We say that the disease "dominated the individual," that "the patient fights against it," "resists it," or "surrenders to it"; that the disease "attacks, progresses and kills"; that the physician "faces it," etc. It is very easy to find similar phrases in medical books.

The same thing happens, and perhaps more clearly, with death. Death is typically personified as a skeleton, generally with a scythe in its hand. We have all seen the famous etching which decorates many waiting-rooms: a young nude woman shelters herself in the arms of a physician, who embraces her with one arm, while he holds off with the other a skeleton that seems to be trying to take his possession away from him. In the face of events so deeply important for their existence, men, in

spite of their rational surface, present deep reactions, rooted in the unconscious which impose themselves on the rational superstructure.

It is interesting to observe that psychoanalysis, the outstanding method of exploring the unconscious, and familiar therefore with its characteristics, has fallen into the same pitfall. The Freudian theory has concretized, personalized the psychological processes, making out of our mental life a theater where defined entities such as the Ego, the Id, the Super-Ego, the censor, fight. In psychoanalysis we find also the primitive demon, the cause of disease, under the name of Thanatos, the death instinct, which fills today's literature.

THE MODERN CONCEPT OF DISEASE

Let us study now in detail the "modern" concept of disease. It is impossible to review all the definitions of disease, but they lend themselves to a classification by taking into consideration the importance they give to one of the following instances:

- (a) Etiology.
- (b) Anatomic-pathology.
- (c) Phenomenology.
- (d) Valoration.

Definitions in which etiology plays an important part deal, of course, with the "cause" of disease and lead us to the discussion of this concept in medicine.

Pophal has made an interesting study of the problem,¹ taking into consideration principally the work of Hueppe, who, analyzing Mach's ideas, tries to eliminate from our discipline the notion of "cause," substituting for it the idea of *function*.

This attempt helps us undoubtedly in the discussion of the concept of cause, a concept so difficult to face in every science and especially in medicine. Could we refer as a "cause" to the spark that lights the powder when, without the chemical characteristics of this compound, the spark would have produced nothing, and when, those characteristics given, any other adequate stimuli would produce the same result? Are those characteristics the cause? If we think of disease new complications arise.

Hueppe says that the external influences which put a phenomenon into motion are secondary to the intrinsic dispositions of the living being. In the case of disease the microbe, for instance, produces disease only because there exists in the organism the potentiality to answer in a determined sense. That answer can be provoked by different stimuli.

¹ R. Pophal: "El Concepto de Enfermedad," La Cultura Medica, Buenos Aires, 1930.

For an interesting example we shall quote from Pophal¹:

As everybody knows, pneumonia is said to be a typical infectious disease, whose most frequent agent is the *Diplococcus lanceolatus*. The problem of the outburst of the disease is not, however, so simple that the presence of man and *Diplococcus* is sufficient to cause the pulmonary inflammation. There are many people who have the *Diplococcus lanceolatus* in their bucal cavity without ever having pneumonia. How does it happen, then, that the *Diplococcus lanceolatus* so frequently found in the bucal cavity, and innocuous, turns up to be in a determined moment a pathogenous agent in the lungs? We know that the normal mucous of the respiratory tract, as well as the alveolar tissue of the intact lungs, has a great power of resistance. Catarrhal inflammation is the consequence of a cold. Cold would be, then, in the sense of the old classic medicine, the "cause" of the pneumonia. We have already two causes.

We must say now that under the same circumstances everyone does not get a cold. Colds have, as a premise, a certain predisposition either acquired or based on congenital peculiarities of the organism. There is enough reason to believe in a hereditary disposition to colds. We have, then, a third cause.

Finally, we must take into consideration the disposition to the *Diplococcus* infection—or the possibility of becoming ill after the infection has occurred—as an important cause, and not forget the fact that after the disease is declared its outcome depends on the most varied circumstances: heart peculiarities, previous alcoholism, etc. All these factors may be considered as causes. Common language prevents no one from considering as the cause of an unhappy result, not the bacillus, but the cold, or the familiar hereditary peculiarity (when, for instance, the father died also from pneumonia), or, if it is the case of a drunkard, the abuse of alcohol. We have, then a group of causes, but which is the principal one, the "cause" in the sense of Hueppe? Not the *Diplococcus*, of course, if we think that it is, as the bacillus coli, an innocuous symbion. Following the theories of natural energetic science, we should say that the cause is the histologic peculiarity of the lungs, where the characteristic process we call pneumonia happens.

Such a process never starts spontaneously or because of the so-called internal causes. It has to be stimulated and put into motion in some way from outside. Not always is the *Diplococcus lanceolatus* the instigator; it may also be the Friedlander's pneumo-bacillus. Or that stimulus may come from a streptococcic infection. Anyway, the concurrence of a lung with morbid predisposition and the probable stimulus is not sufficient for pneumonia to be provoked since other very particular conditions need to be present, and those conditions are submitted to great oscillations.

We shall present another example: Let us suppose that an individual going down a flight of stairs slips and, in falling down, suffers a fracture of the forearm. Where is the cause of such a fracture? Is it in the fall with the weight of the body on the arm? In the position of the forearm in the moment of the accident? Suppose our subject suffered some previous disease which produced an increased fragility of the bone, without which the fracture would not have been produced. Would that disease be the

cause? There is something else. Let us consider that the subject slipped on something he obviously did not see, because of some eye defect or because he was absorbed in his thoughts. Had that defect or that preoccupation not existed, the fall would not have happened. Were they the cause? Here we remember the discoveries about the "accident-habit," the predisposition to have accidents. If our subject possesses a personality of that type, we again have the concept of cause displaced. We may increase the displacement if we think of the factors determining such a personality structure.

If the concept of causality is useful in the physical sciences (we have already referred to the fact that in those sciences it is also theoretically in bankruptcy), it is not in biology. The reason may be found if we consider the living being as not reacting in a simple way but as a totality, a Gestalt. In physics we can, with the already stated limitations, speak of *cause* and *effect*, but in biology the first of the two terms is changed to *stimulus* that, acting over the living Gestalt, produces a *response*. Such a response is conditioned, not only by the stimulus but by all the other internal or external stimuli influencing the system, and by the characteristic proper to that system.

We find ourselves, then, before a complex series of relations needing a wider criterium. Mach says:

It is possible in every phenomenon to find direct and indirect relations of dependency. Therefore, all the clearly and exactly recognized relations can be conceived as simultaneous reciprocal relations. That which is functional refers to the reciprocal dependency of two phenomena and excludes the primacy of one unique member of the chain, selected as cause.

The idea of cause is not useful in medicine and cannot be accepted either as a criterium for the definition of the concept of disease, or as the "essence" of it. But if we reject it, we must look for a better substitute. The notion of *function*, the expression of interdependent relation, may be taken into consideration. We shall refer to that again later.

Definitions in which anatomic alteration is assumed to be the essence of disease were born with Virchow. Following the discovery of cellular pathology, the essence of disease was believed to be found in the morphologic alterations of the cells and this conception, in spite of its deficiencies, still persists in present-day medicine.

It is very simple, however, to point out its pitfalls: there are diseases without any anatomic alteration and the argument, so often misused, that anatomic alterations do exist but are yet undiscoverable, is

so infantile and lacking in any logical or scientific basis that it cannot be taken into consideration. On the other hand, it has been proved in many cases, perhaps in a large majority, that disease begins with a functional alteration, producing subsequently an anatomic change. Finally, going deeper into the essence of the problem, modern biological knowledge leads us to believe that the essence of natural phenomena lies in the vital *processes*, not in the static properties of any structure.

The phenomenologic definitions find the essence of disease in the symptoms, the exterior manifestations. In connection with disease, symptoms were the first to be noticed and phenomenologic definitions are the first ones in history. Hippocrates gave these ideas the authority of science and since his time they have been present in almost every definition, even the most modern of them. These definitions give to the symptom a fundamental importance, taking them as a basis for classifications and for the creation of pathologic entities. Even today, this phenomenologic criterium in different forms and in combination with others is found in most accepted nosologies. The study of diseases is generally made by classifying them according to organs or systems; that is, according to the symptoms appearing in those organs or systems.

All definitions which take as a basis *alteration in function* are nothing but phenomenologic, the alterations showing themselves through symptoms.

It is not difficult to perceive the defects of this concept. It needs, to begin with, the definition of *symptom*, or the determination of the conditions under which a functional alteration must be considered *abnormal*, i.e., a discussion of the notion of normality. On the other hand, even if we were able to establish a clear-cut criterium of normalcy for every one of the functions, that would be insufficient to give us a serious pragmatic foundation. A classification of diseases based on symptoms is clearly incomplete and useless. As we know, different processes may produce the same symptoms, and the same pathologic stimulus may cause different symptomatologic pictures. The phenomenologic criterium is, then, superficial and unsatisfactory.

Jaspers has pointed out that in a definition of disease there is always a concept of valuation. The reality of that observation cannot be discussed, and the attempts of Jaspers to free himself from that tendency do not appear to be successful.

It is understandable that in this case, as always, man is the measure of everything," imposing on the concept of disease a negative valuation. Disease is abnormality, deficiency, danger, which means in-

dulgence in the teleologic orientation from which medicine has been unable to free itself. A valuation, on the other hand, is a concept of relation and implies a *norma*. We are again confronted with the problem of normalcy. When is any alteration of the organism called normal, and when is the transition towards disease made? We cannot at this point study the idea of normalcy in all its aspects. That has been done on another occasion,² and we shall reproduce here only the conclusions: The most acceptable concept of normalcy is related to that of adjustment. An organism able to adjust to a determined environment in a more or less stable form may be considered normal. In any case, we do not see how a concept of valuation, relative and changeable, can be considered valuable in the practical search for the *essence* of the disease or the possibilities of founding a nosology.

THE CONCEPT OF DISEASE IN PSYCHIATRY

It is useful to turn now to psychiatry. Because of reasons easy to understand, the problems of theoretical medicine occur in psychiatry in even more difficult forms. This is illustrated by reviewing those problems which have been analyzed so far:

1. The etiologic concept of disease cannot succeed in psychiatry, and a nosology with an etiologic basis has been impossible. The notion of cause is still more difficult to apply here than anywhere else.

2. The anatomic concept helps us no more. There are very few psychiatric syndromes with clear anatomic alterations, and, when they do exist, they never shed light on the psychopathological picture, nor do they help us to an understanding of it.

3. This explains why the phenomenologic concept predominates in psychiatry. It is sufficient to support that statement by reference to the fundamental works of Jaspers, Kurt Schneider and Adolf Meyer. Meyer's classification, the backbone of American psychiatry of today, is essentially phenomenologic.

We do not need to repeat the reason given above to affirm our conviction that, in this case as in general medicine, an exclusively phenomenologic criterium is not satisfactory, either to establish a concept of disease or to build a nosology.

4. Valuation in psychiatry is an implicit part of the concept of disease, even more than in medicine, but it does not help us in our search for a useful concept of disease.

² Seguin, C. A.: *La psicoterapia moderna y la Higiene Mental*. Lima, 1941.

TOWARDS A MODERN CONCEPT OF DISEASE

We may conclude from the analysis just made that no one of the concepts of disease reviewed is satisfactory. They are obsessed in a greater or lesser degree with the idea of disease as something exterior to the organism, something added and parasitic. We believe that freedom from that pre-logic idea is a necessary condition in order to find a more satisfactory way.

Disease is, in the last analysis, a vital manifestation, and must be considered as such. In life, we must study the fundamental, dynamic, uninterrupted interrelation of the living creature with its environment. That interrelation can be expressed in one word: *adjustment*. The living being, aside from a possible "spontaneous" activity, *reacts* constantly to the stimuli of its environment, adjusting itself to them and maintaining its equilibrium, that is, its life.

Stimuli vary in their power to disrupt that equilibrium. If their power is not great, and the organism is able to adjust more or less easily, the stimuli are called *physiologic*. When that disrupting power is greater, they become *pathologic*. During the perennial evolution of life many "*pathologic*" stimuli, by means of successive adaptations, mutations and selections, may become "*physiologic*."

To both of them the organism reacts, thus restoring its equilibrium or trying to do so. When the stimuli have little disrupting power the reaction is *physiologic* and does not generally appear in the consciousness. When that power is greater, the reaction is called *disease*, and it appears in the consciousness in the form of symptoms.

We now have the following definition: *disease is the reaction of the organism as a whole to external or internal stimuli altering seriously its equilibrium.*

Let us analyze it:

1. *Disease is a reaction of the organism.* This statement takes us away from the primitive concept of personification already discussed, emphasizing the characteristic of *reaction* adjudicated to the disease. It fits also into R. Mayer's energetic concepts of causality. The real "cause" lies in the previous characteristic dispositions of the entity in which the process happens.

Thus the emphasis is completely displaced. Let us consider the following example: in pneumonia—to speak of something already discussed—the presence of the pneumococcus is not the decisive factor, but rather the reaction of the organism: mobilization of physiologic and anatomic processes provoked in certain circumstances by its presence.

But, if disease is a reaction of the organism, does

disease exist when that reaction is not present? Are not the effects of a parasitic (paludic anemia) a physiologic (destruction of tissue by heat) aggression considered as disease?

2. We believe the answer to these questions rests in the complement of the phrase. The definition reads: "the reaction of the organism *as a whole*." It means that we must not consider isolated facts. Anemia is only one aspect of malaria, as are also the reaction of the hematopoietic organs, the typical fever and the psychological components of the process. If we understand it, we shall be able to realize how important is the totality of the picture.

Let us analyze further this concept of totality. There are no diseases of organs or systems; it is the organism as a whole which reacts. This is vital and considered from the point of view of the relation between mind and body, psyche and soma. We cannot study that problem here, but leaving for another opportunity a critical analysis of it, we shall say that upon considering the organism as a whole the dualism disappears, and that since disease is a reaction of that totality, there are no somatic or psychic diseases, no somato or psychogenesis. Every *pathologic process has organic and psychologic components*, being as it is the product of a psychosomatic unity.

In the cases in which there is really no reaction of the organism (we doubt that any such case may exist), we may speak of *lesion* and not of *disease*.

3. The definition speaks of *external and internal stimuli*. It is unnecessary to analyze this part further; its scope is easily understandable.

4. The following phrase is perhaps the most difficult part of the definition. It says: "*external or internal stimuli altering seriously its equilibrium*." An embarrassing question appears: when shall we say the equilibrium is *seriously* altered? It is very important to answer this question because the answer furnishes us with the criterium of differentiation between the *physiologic* and the *pathologic* reactions.

We shall not enter into a discussion of the countless opinions that exist. Every theoretician has his own. Let us go back to the concept of adjustment. The normal organism adjusts itself continuously to the variations of internal and external environment. Changes in equilibrium are compensated more or less rapidly. When these alterations of equilibrium are sufficiently serious, they provoke *unsuccessful* efforts at readjustment; they provoke *disease*.

This incomplete or unsuccessful adjustment shows itself subjectively and objectively. We call *symptoms* the subjective, and *signs* the objective

manifestations of disease. The former reach consciousness charged with a peculiar affective tonus: that of suffering or displeasure. The latter are localized in the different organs or systems and can be discovered by our "diagnostic means."

The equilibrium is, then, *seriously* altered when the organism cannot recover it, the results of that unsuccessful or deficient adjustment appearing as symptoms and signs.

The definition thus considers the living being as a dynamic event and not as a static scheme destroyed by disease, and so does justice to its complexity.

A FORMULA OF DISEASE

Following what has been said about the notion of function in medicine, we can allow ourselves to suggest the following equation, without pretending to reduce the vital stream to mathematical formulae, but only as a synthesis of our ideas:

$$X = F(E, e)$$

X stands for the disease, which is a function of the stimuli (E) and the equilibrium of the organism (e).

It is easy to understand how the terms of this equation can become complicated, if we consider diverse stimuli, external and internal, and all the conditions of equilibrium of an individual in a given moment; heredity, predisposition, immunity, etc. Such a consideration saves our formula from being thought of as a naïve simplification. That stands out clearly if we apply it to the case of pneumonia already considered:

$$X = F(\text{Cold} + \text{diplococcus} + \text{environmental factors}) \\ (\text{predisposition} + \text{previous pathology}).$$

If we treat cold as another disease, the factor E becomes complicated:

$$E = (\text{Cold} = F[E, e]) + \text{diplococcus} + \text{environmental factors}.$$

Considering now in *e* the factors of predisposition and "previous pathology" (also diseases), we shall understand the infinite complication we can reach:

$$e = (\text{Acquired predisposition} + \text{hereditary predisposition}) + (\text{cardio-vascular diseases} = F[E, e]) \\ + (\text{alcoholism} = F[E, e]).$$

The acceptance of the foregoing concepts, aside from its theoretical advantages, has some interesting consequences: our diagnostic methods have to be redirected. We are no longer trying to "put a label" on a clinical picture, *i.e.*, to discover "pathognomonic signs" to allow us "to fit" the given case in the frame of a nosologic entity. We must understand a *reaction* as such in all its unique characteristics, considering each one of them as "factors." The disease is a *function* of all of them. This will draw us away from the harmful tendency to label when the really important thing is to understand a dynamic and individual event.

There is another fact of importance. The consideration of the disease as a reaction of the individual permits us to classify it as an *expression* of that individual. We refer the reader to the analysis of the concepts of E. Husserl by R. Allers.³ We have arrived, by parallel roads, at the same concept. If disease is an expression, it can only be considered as a unique phenomenon, and handled as such.

The importance of this viewpoint for the concepts of etiology, diagnosis, nosology, and therapy can only be pointed out here.

³ Allers, Rudolf: Concepto y método de la interpretación, in: Schwarz, Oswald: Psicogénesis y psicoterapia de los síntomas corporales. Edt. Labor, Barcelona, 1932.

PSYCHOANALYTIC TRAINING

The Psychoanalytic Clinic for Training and Research, Department of Psychiatry, Columbia University, offers to qualified physicians a three-year course of graduate residency training in psychoanalytic medicine. This course is based on complete training in psychoanalysis, includes psychosomatics and is combined with graduate training in the other branches of psychiatry.

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The next first-year class begins October 1, 1946.

ANALYSIS OF NEUROSES DEVELOPING AFTER COMBAT IN FOUR INDIVIDUALS WITH OUTSTANDING COMBAT RECORDS *

SAMUEL P. HUNT, LT. COMDR. (M. C.) U. S. N. R. **

This paper presents the histories of four typical men with good combat records who developed disabling neurotic symptoms in relation to combat in the Pacific, and who for that reason were evacuated from the forward area. In each case an attempt is made to analyze the neurosis and to discover what relationship it has to the personality and previous experience of the patient. Finally, the case material presented is made the basis for a discussion of some neurotic mechanisms observed in combat neuroses.

METHOD

The report is part of a study conducted while the author was the psychiatrist for an auxiliary hospital ship operating in the Pacific combat area. The findings are typical of his service experience in general. Practical conditions at the time allowed a total of about five hours over a period of three days for study of individual patients. Preference for treatment was given patients whose neurotic reactions were the more severe and whose symptoms appeared related directly to their combat experience. The four cases reported are otherwise unselected; they are representative of the neuroses meeting these criteria. First, a history of the present illness and the personal and family background was obtained. All patients received a physical and neurological examination and an estimate of the mental status was made. To insure approximately standardized methods, a six-page mimeographed anamnesis form was used in which special emphasis was laid on a search for previous neurotic behavior, symptom and attitudes.

During this preliminary work, which usually required about two hours to complete, an effort was made to establish the necessary rapport, and a general impression of the nature of the illness was formed. The latter was discussed frankly with the patient in general terms and treatment then proposed. Most patients are at first bewildered and humiliated about their symptoms and are grateful for a clearer conception of their illness and for

reassurance as to their prognosis. Their anxiety is somewhat relieved and they are better able to devote their attention to the treatment. After this preliminary work the patient was introduced immediately to the therapy.

Intravenous pentothal was used in an attempt to bring out material connected with the traumatic situation in addition to that obtained in the anamnesis, and to enable patients to abreact which they consistently failed to do in the history-taking interview. They were told simply that the drug helped them to relax. Occasionally, they exhibited marked anxiety about the treatment and required additional reassurance and a manner of the greatest gentleness on the part of the therapist.

The patient was brought to the treatment room and asked to lie down on the table. The atmosphere was casual and cheerful and conversation was encouraged. The situation was such that almost invariably he began to talk volubly about his combat experiences as soon as he was settled. He was admonished to report faithfully everything that occurred to him at all times during the treatment. The drug was administered slowly and in a matter-of-fact manner. When the speech became slurred, further injection was delayed or the drug was stopped.

With little questioning it was always possible for the subject to recall very specific experiences apparently responsible for the appearance of the symptoms. In this paper these are referred to as the "traumatic" experience or event. The patient was then told he was again going through that experience and was urged to report all that he saw or felt. During the treatment other historical material was collected as opportunity presented itself. With pentothal, patients usually talked easily, with much affect and at length, sometimes for more than two hours at a time. Their repetition of the traumatic experience was often extremely dramatic. They reviewed the sequence of events and their emotional reactions leading up to the development of the symptoms with little guidance. This was followed by associative ideas, very prolific and frank reminiscences, and revelation of personal problems. Occasionally, as the patient talked, a few obvious interpretations were made, but in the main the

* The opinions or assertions contained herein are the views of the writer and are not to be construed as official or as reflecting the views of the Navy Department or the Naval Service at large.

** U. S. Naval Hospital, San Leandro, California.

attitude of the therapist was that of an interested and sympathetic prompter. Patients were not incapacitated by the drug and immediately after each treatment were able to go about the ship.

Pentothal was found to be useful and practical in "out-patient" treatment. Not only did it seem to help some of the patients to abreact, but it was also an aid in quickly obtaining significant material previously obscured by amnesia or conscious inhibition. Although admittedly difficult, a comparison between the data obtained in taking the anamnesis and that under pentothal consistently showed that the latter led to much greater detail and to frank communication on subjects about which the patient had shown considerable reserve during ordinary interview. The immediate and dramatic response to pentothal was often astounding. Traumatic material and affect, which could be elicited during the anamnesis only in a general and impersonal way and only with considerable effort, was often suddenly revealed with the first cubic centimeters of the drug. Like the rising of a curtain, and sometimes without any suggestion whatever, the patient was suddenly back in the traumatic situation, reporting with great emotion the particular events that had disturbed him. This phenomenon in many cases was far more dramatic than the emergence of the personality in catatonic stupor under sodium amytal. Patients who were reserved in describing their personal life and who showed inhibition of affect in discussing their emotion-laden experiences, under pentothal discarded these resistances and exposed their mental content more or less freely. Only rarely was it possible to elicit the affect and to obtain the rich detail of experience without the use of artificial means (drugs or hypnosis). It was found that the more remote the patient in time from anxiety producing experiences, the greater is his difficulty in expressing himself without help. The efficacy of pentothal also correspondingly decreases with time and distance from the combat zone, but is still an aid to catharsis when ordinary interview is characterized by such patent defenses as lack of affect, hostility, rationalization, and conscious reluctance to vocalization to avoid anxiety. It appears that as time progresses the patient succeeds gradually in repressing his anxiety except for the more or less isolated eruption of apparently meaningless symptoms and for autonomic nervous system disturbances. As defenses are constructed it often becomes more and more difficult to uncover the original anxiety with its memories—either that of the traumatic combat situation or that which always lies in the more

remote historical background and which supplies the momentum for the neurosis. This elaboration of tenacious defenses is the most compelling argument in favor of treating patients as soon after their breakdown as they are able to take an objective view of themselves, and may explain some of the baffling difficulties so generally met with in late treatment.

The immediate increase in warmth of affect and in the desire to communicate when under pentothal is like that seen after administration of sodium amytal, but has the advantage of a less lasting effect on the nervous system. In this study, patients who failed literally to rehearse their experiences and their anxiety during treatment were taught as far as possible to free-associate while still under the influence of the drug, in the search for the meaning of experience and symptom. The drug seemed to put them also in a more communicative and reflective mood. Pentothal can safely be said often to reduce the barriers the patient has erected against awareness of anxiety.

CASE I

John Frank,¹ a 27-year-old Marine, participated in a thunderous assault-landing against a Japanese island. Two months later, he returned with his unit to a rest area. He was extremely tense and had been having terrifying nightmares. He had gross tremors of his arms and legs. He was sent to a naval hospital where his symptoms became more severe. He developed a stutter and complained of persistent headache. He was irritable and depressed. After a period of observation he was sent aboard ship for transportation to a rear area hospital. His chief complaint was: "I want to get rid of these bad dreams. I have headaches and I shake all over. I can't write a letter." He was very tense and there were gross tremors of his arms and legs.

Anamnesis: Frank performed well in the hard-fought campaign. Three weeks after the landing, two episodes occurred after which his symptoms first appeared: The patient and two other Marines were sent out on patrol to discover the location of a certain river. Frank carried a transit and other surveying gear. His companions were heavily armed and were to act as a bodyguard. They struggled for a long time through a swampy jungle. Japanese artillery fire was active. Shells were dropping with increasing frequency. When one exploded forty feet ahead, the men took cover behind a log in a clearing in the jungle. The patient lay

¹ All names of patients are pseudonyms.

as deeply as he could in the mud and kept his head down for several minutes. During a lull in the firing he looked up to make a "wise-crack" to his companions. To his anger and despair he saw them disappearing in the jungle in the direction of their camp. The patient was unarmed except for a knife. Shells again began to blow up around him. There seemed to be no possibility of escape. He lay behind the log all day, cursing the two Marines for leaving him, and planning revenge. By night the shelling subsided but he could not sleep. It seemed to him that every jungle noise was made by advancing Japanese. He clutched his knife and waited, expecting every minute to feel them upon him in the dark. He did not dare move. In the morning, he made his way back to his battalion. He was "boiling" with rage but said nothing about the desertion of his companions. He watched for them about the camp. He said he wanted to kill them both.

A second significant event occurred two days after returning from the patrol: he received a very disturbing letter from his mother. In it she wrote of going to live with his wife and child, a thing he had been trying to prevent. (Further elucidation of this curious relationship was not possible at this time.) The letter worried him extremely. It revived in him an old feeling that his life was "hopelessly fouled up." That night he began to have horrifying nightmares. The patient told no one about his nervousness, however, and continued working. After he returned with his unit to a rear area his symptoms suddenly became more pronounced. He felt extremely depressed that his companions had deserted him. He felt he could never trust anyone again and swore to get revenge. He became disturbed by reminiscences about his early life with his mother. He was afraid to sleep because of his nightmares. After the gross tremors and the headache developed he reported to the doctor and was admitted to the hospital.

Personal History: The patient's grandfather was a chronic alcoholic. His parents were divorced when he was 7 years old. His brother had "nervous tics" as a child. His father was a miner and worked at night. Although he was kind to the children he did not have much time for them. Frank's mother was obviously mentally ill. She was extremely cruel to the patient and his brother. She would tie him to a bed-post or lock him in a closet while she had promiscuous sexual relations with men. She beat him frequently and threatened to send him to reform school if he told his father.

After the divorce the patient lived with his father until he was 12 years old. He spent the

next three years in an orphanage from which he ran away several times. His brother died while in another orphanage and the patient believed his mother responsible. When his father remarried, Frank went to live with him again. He did not finish high school although he was a good student. For a while he thought of becoming a priest. After leaving school he worked for three years in a job involving considerable responsibility. He left it, however, and went to another city to be with his father. He stated that he had many fears and nightmares until he was 13 years old. He was terrified of his mother and hated her intensely, but he did not dare to seek the protection of his father. He has had frequent episodes of "moodiness" and depression during which he would get into a car alone and drive all night, and he stated his present mood was somewhat similar to his reaction then. He was irritable and aggressive at times, and got into many fights at school. He did considerable drinking from time to time. Once while driving a car he had an accident and was knocked unconscious. He said he came to three days later while walking along a road and that he does not recall what happened during that interval.

His sexual life had not been unusual. He married at the age of 25. He was loyal to his wife and protective toward their one child. He left them, however, in 1941 and volunteered for the Marine Corps "because the country was at war."

Examination: When seen aboard ship the patient was extremely tense and anxious in appearance. He was small and slight and had obviously lost weight. His face wore an expression of anxiety and sadness. However, he was alert and animated and appeared disproportionately self-assured. He was both suspicious and friendly. He appeared to be a person of better than average intelligence. In talking with him it was obvious he had much pride in his work achievements and in his record in the Marine Corps; in fact, he seemed to be compulsively conscientious and protested how capable he was and how well he could control his emotions. Whenever much self-control was required, such as while on patrol, he would recite to himself a poem he had learned as a child. During the initial interview he quoted it in full. He talked mainly about his hostile feelings toward his mother and the two companions who deserted him. He was dramatic and extremely bitter and spoke with a coarse and atypical stutter. His arms were in constant gross rhythmical movement. These tremors subsided somewhat when his attention was distracted. He was lacking in insight and said he wanted to re-

turn to duty. He described a typical nightmare as follows: "I see my mother directing the Jap artillery. I'm behind that log again. The shells are exploding all around. I used my transit as a spyglass and I can see her giving the Nips fire orders. I can't run, I can't move. I know they are going to fire at me. I can see her dragging my wife and kid up the hill to where I can see them. I can hear her holler and she lets the Jap screw my wife and I holler I will cut her throat. Then my wife is gone but my mother gives the kid to a Jap who puts him in the breech of a gun to shoot at me. When the gun fired I woke up." In addition to this kind of a dream, the patient stated he had numerous others which he recognized as repetitions of nightmares about being punished by his mother which he had had as a child. He was not paranoid and there was no evidence that the patient had a psychosis.

While en route, Frank received about four hours of psychotherapy. First he was given two treatments with intravenous pentothal. With the first few cubic centimeters he immediately began a vivid rehearsal of the traumatic experience with convincing authenticity: he was extremely dramatic. He seemed to be in a state of dissociation and reported the sequence of events as if he were again actually there. He added much to the anamnesis, namely: affect, a motor dramatization of the traumatic experience which included details not mentioned in the anamnesis, and ready associations to specific affect-laden childhood experiences without leading queries from the therapist. He became restless and disturbed on the table. He "ducked" from shells which he said were flying overhead, and listened with his head cocked for the sound of the explosions. He made burrowing movements as if to dig deeper into the mud and to cower against the log. He held conversations with two imaginary companions, and joked about the enemy artillery with ironic humor. At the point in the rehearsal when he discovered the disappearance of the two men he yelled in rage and despair. He cursed at them vehemently. He went through the pantomime of throwing a knife at their retreating figures. After "they" left he lay on the table talking sadly to himself. Tears came into his eyes. Then he seemed voluntarily to emerge from this trance-like state and to make partial contact with the examiner. He said: "It was like when I was a kid. She forced me into a closet alone all day and the walls were closing in on me. My mother is a no-good bitch. She tries to get my wife and kid away from me." He told of her beating him repeatedly with a whip

and of her threats to cut off his penis. He said he used to be speechless with rage and helplessness. He expressed great hatred and bitterness toward his mother. At this point, on the treatment table, he appeared again to lose contact with the treatment situation. He began to act out and vocalize what he explained later was a repetitive dream, similar to the one described in detail above: his mother was seizing his wife and child while he looked on, helpless because he was tied down. His frantic yells awakened him and considerable reassurance was necessary to quiet him. After the second treatment with pentothal, during which the same situation was again repeated with equal affect, he said he felt somewhat better. Unfortunately, further exploration was not possible owing to limitations in time and the lack of adequate facilities for prolonged treatment.

Discussion: At about the age of 5, this patient was the helpless victim of sadistic drives of a quasi-psychotic mother. The father was too inadequate to interfere and the patient may have been too submissive toward his mother to appeal to him. Toward her he did not dare to demonstrate aggression. The period in the orphanage contributed to the patient's deep sense of rejection. He had fears and nightmares, and frequent spells of depression and loneliness. His past combativeness, his masculine bravado and his great pride in his achievements in the Marine Corps contain a large element of protest and of overcompensation for his fantasies of submission and passivity. His dreams have some of the characteristics of the usual battle dreams seen in patients with combat neuroses. But to a greater extent than usual, in them there seems to be repetition of childhood scenes in which he is the helpless object of the aggressive mother, and probably scenes also of witnessed coitus. There is some reason to suspect that the patient identified himself with his mother during these times. The battle content is obviously symbolic of these early problems. The content of his dreams and his present preoccupation with the old problem of his anxiety and repressed hostility toward his mother show clearly that the traumatic situation—the desertion by his comrades and his mother's letter—constitutes the precipitating agent for the recrudescence of a disabling, long-standing, neurotic illness. He went through two weeks of strenuous combat with impunity; then, while unarmed, he was betrayed by friends and left helpless in the face of sinister attack. This was a very dramatic repetition of the childhood trauma and, with the mother's letter, aroused toward consciousness his old hostility, heretofore

largely repressed. One judges that the tremors, headache, stuttering, and depression were compromise symptoms in this complicated conflict concerning aggression and masochistic submission. His reaction to pentothal was dramatic, and the drug was obviously useful in exposing the basic problem. Most patients, including this one, state after even this obviously inadequate treatment that they "feel better," and objectively their tremors and other symptoms seem frequently to be reduced, at least temporarily. Whether there is any lasting benefit awaits more extensive work and careful follow-up studies.

CASE II

Louis Alpers was a 20-year-old Navy flight photographer. He had made a good record in the air service and said he had been happy. At the time of the accident which led to his admission to the hospital he had flown in a Navy bomber 300 hours in three months on reconnaissance missions over Japanese held bases. The assignments were dangerous and the crew was becoming fatigued and irritable. They were apprehensive on landings and take-offs. On several occasions the bomber nearly crashed. The patient felt his tension gradually increasing. He believed his luck was "running out." In April, while flying near a strong Japanese base, the bomber made a forced landing in the water. They had been flying high and using oxygen. One by one, three of the engines caught fire. The crew threw everything movable overboard. Radios, cameras, guns, extra clothing, and even flashlights were thrown out to lighten the ship. The plane continued to lose altitude and the crew hacked away the gun-turrets with axes.

As they approached the water, they spread out extra parachutes to cushion the interior. The plane crashed into a heavy sea. The tail was torn off completely and all the men were thrown clear, with the exception of one who was killed. The patient found himself in the water 50 feet from the place of the landing. He was unable to swim. His life preserver had been torn from him and his legs seemed "paralyzed." He seized an oxygen bottle and was able to float until rescued by the others who had inflated a rubber life raft. As he climbed into the raft he saw a flying boat trying to land to rescue them. To his horror, this plane also crashed in the heavy sea and sank in a few minutes. Several members of her crew were killed. The survivors joined the crew of the bomber.

The patient lay exhausted and frightened in the bottom of the raft. He was now able to move his

legs and was shaking violently. The men drifted for two days in a rough sea without food or water. Finally, they were rescued by a destroyer and brought to an advanced naval base in the Solomon Islands. The patient was extremely tense. He had headaches and frequent spells of vomiting. The "jerking" of his arms and legs became more violent. He found he was stuttering for the first time in his life. He could not get the thought of the crash out of his mind. He could not sleep; nightmares disturbed him. The noise of the aircraft made him jump violently. He bit his fingernails. He cried frequently. He had been very fond of the young officer who was killed and kept thinking he should have saved him. He felt bitter and depressed. Whenever he could, he said Mass for him. (That a Jewish youth went to Mass is probably an expression of the urgency of his need for ritualistic mourning and because Catholic ceremony was more readily available to him.)

Personal History: According to the patient, his parents were happily married. His father was a scenario writer in Hollywood. He was preoccupied with his work and the patient, an only child, spent most of his time with his mother. His family was very indulgent toward him. There had been nothing obviously unusual about his sexual life. There was one striking fact in his past history. When he was 8 years old he saw a woman killed by an automobile. He said that since that time the sight of blood made him "deathly sick." He also described feelings of tenderness toward animals which seemed pathological in degree. He remarked: "I can't think of killing a wild animal. I was miserable for months after shooting a rabbit. I would get sick if I had to kill a bug. Once Dad almost ran over a dog; I hit my cousin because he laughed, and I started to cry. When Mother would clean a chicken I had to go away. Even seeing pictures of an operation in a magazine would make me sick."

The patient did well in high school and was graduated at the age of 17. He did not study hard and was rather frivolous in attitude. During the summers he worked in a clothing store and became a successful salesman. At the time of his graduation he won a commercial art scholarship but, instead of using it, enlisted in the Navy.

Examination: When seen on the ship a month after the accident, the patient exhibited gross involuntary, tic-like grimacing. There was no startle reaction and no evidence of tremors at the time. He was alert and self-assured and only moderately tense. He seemed predominately depressed in mood

He said: "I'm bored with it all and I feel sorry for myself. Nothing bothers me—I just don't want to fly anymore. It's just like hitting a brick wall when you hit that water. I didn't like to see my buddy killed."

He said he had a "splitting headache" but did not mention his grimacing. When asked about dreams he had had since the crash he said: "I dream like I used to when I was a kid. I'm floating in space and then there is a louder and louder noise like a roar and I wake up scared. Sometimes I dream there is a big spider on my foot. I wake up and shake my blanket before I realize it was only a dream. I'm afraid to kill bugs. Mom would tell me to kill one but it would make me shudder all over. Just as I'm falling asleep I go over the crash. I might have been able to save a couple of guys. I say to myself: 'You didn't do all you could instead of lying there like a fool.' I try to excuse myself. I could have done more. I go through the crash again. How hard we hit. I talk to those dead guys. I say: 'I'm sorry I didn't pull you out.' R. and I had been together so long. I've never had any brothers. This guy used to censor my mail. He was like a brother. He was the only guy I could talk to. He was very good. He didn't deserve to die." The patient was very emotional and he talked at length about the dead man. Submissive overvaluation of the dead officer was striking and very suggestive of an unconscious homosexual attachment for him.

Some time after seeing Alpers, an opportunity came to examine similarly another member of the crew of the same airplane who was also being evacuated for a much milder degree of nervousness. This patient said: "Alpers was always pretty nervous. He was restless and full of crackpot ideas. He had a different slant on things than the rest of us. He wasn't very well liked. When the engines caught fire he started to stutter and there was a wild look in his eyes. We were all joking and wisecracking but Alpers didn't say a word. In the water he was screaming bloody murder. When we got him into the boat he was moaning and groaning and jerking all over in spasms. He kept asking where R. was, though we told him fifteen times that he had been killed."

While en route, Alpers received about four hours of psychotherapy. First he was given two treatments with pentothal. He was very reluctant to submit to venipuncture, saying he hated the sight of needles and blood. His transference attitude was thus a clue to his basic problem. Under the drug he was able to re-enact the traumatic experience

minutely. In the rehearsal he showed considerable affect and some motor activity. However, he did not entirely "shut out" the treatment situation. He was mainly concerned with feelings of grief over the loss of his friend, R., and cried profusely. He repeatedly blamed himself for not rescuing R. With the second treatment, the patient had greater difficulty accepting the "needle" and was extremely reluctant to "go over it again." When he finally submitted, he could not "lose himself" and kept well in contact with the therapist. He talked again about the loss of his friend and was allowed to dwell on this subject at length, with occasional words of reassurance. Further abreaction then became increasingly blocked by anxiety pertaining to the transference. He was therefore asked to free-associate in regard to the involuntary movements of his legs and face. He said the movements reminded him of an episode that happened when he was 10 years old. While with his mother he saw a man whose "arms and legs jumped and his face twitched." His mother told him the man was a "spastic" and could never be cured, and the patient remarked dramatically that he ought to die because he, too, was incurable. "I want to prove I'm not a spastic," he said "he was helpless—I feel sorry for things that are helpless. I'd rather die than sever any part of my body. I saw two sailors once—one had an arm missing—the other, a leg. To be a spastic is like being dead."

While on board, the patient carried with him a detonator taken from a Japanese anti-aircraft shell. He valued it as a souvenir. When asked to talk about it, he said: "It fascinates me. I like to look at it and polish it up. It's the little damage that makes the shell go off. It knocks you out of the sky and you can't do anything about it. You can't scare it away. It's a little bundle of trouble and I have it in my hand and it can't do a darn thing. I've got it and I'm not going to pull the pin. It might go off sometime and I'm a little worried about it. I'd like to take it all apart and then I could say: 'Now you little bastard, you can't do anything'."

Discussion: This patient had great anxiety at the sight of blood and viscera and his feelings of tenderness for animals and insects were undoubtedly a reaction-formation. This and the anxiety-laden memory of the accident to a woman when he was 8 years old would lead one to look further for evidence of feminine identification and fantasies of mutilation and hostility. For a long time before the accident the patient had been exhibiting increasing conscious anxiety, the specific meanings

of which can only be suspected. He was in a severe panic as the crash threatened, while the other members of the crew were not. The subsequent symptoms and outbreak of anxiety were associated with a mourning reaction to the loss of a homosexual love-object and with fantasies of castration. The temporary paralysis of his legs while in the water may have been due to concussion, but the subsequent violent, involuntary movements represent an identification with a "spastic" and with a legless soldier. Through these symbols he expressed both a guilt-motivated fantasy of injury and a passive wish. His reaction to pentothal was dramatic. It is clear that the accident was traumatic to this patient because it mobilized powerful fantasies of mutilation, of guilt and of mourning in relation to the sudden, violent interruption of a homosexual attachment. Clinically, the patient seemed to be in a homosexual panic, and this particular dynamic situation is, in the author's experience, of strikingly frequent occurrence in combat neuroses. The souvenir in this case is significant. Alpers fondled and spoke with disproportionate affect about a potentially dangerous object. It may be that this behavior represented his attitude toward masturbation and his efforts to control it.

(In contrast to Alpers is the case of Ramsey, a 26-year-old chief photographer's mate, who was a member of the crew of the same aircraft. Ramsey was being evacuated for mild nervousness after the crash. His only symptoms were moderate insomnia and tension, reminiscences of the crash and some loss of interest. He denied combat dreams or nightmares of any kind. Like all members of the crew, he had been working long hours and felt constantly irritable and restless for many months before the accident. He had lost 40 pounds in weight. Although subjected to the same experience, he did not exhibit anxiety before the bomber made the water-landing, and was able to behave rationally afterwards, without confusion or terror. He admired R. but was not unduly depressed at his death and spoke of him in a quiet and objective manner. During the interview he remained calm and objective while reporting the experience. He had no fear of flying and said he was ready to return to duty. He stated that when he was 15 years old his parents began to quarrel, and five years before they were divorced. He was independent as a child and did not seem to be intensely attached to either parent, although he preferred his mother to his father. He was married at the age of 23, and although he was fond of his wife, in

discussion he was not overemotional about her. Occasionally he had had ejaculatory *præcox* and he stated he had always been "rather nervous and bashful with girls." As a child he had fears of the dark and of water, and nightmares of falling through space. He said he had always been "pretty restless and excitable and rode on his nerves." His school and work adjustment was consistently good and he showed much energy and initiative. His social relationships, aside from moderate timidity, had apparently been normal. There were no abnormal reactions to the sight of blood or violence.

(His mood and manner were essentially normal and there were no tremors or startle reaction. He seemed frank, thoughtful and generally well-integrated. He said he was improving rapidly. He was given one pentothal treatment in an effort to investigate the degree of unconscious anxiety. He reported the crash again, with little affect, but showed flushing and some increase in pulse rate which he had not demonstrated before. Under the drug he repeated that he should have saved R., and shed a few tears. He ruminated over the fact that he might have been killed but did not exhibit the concern and the dramatic affect observed in the other cases. His reaction to the crash was judged to be essentially a normal one, and in spite of careful search, there was little evidence of recrudescence of old neurotic trends. In comparison with the histories of the other four patients, the past history in this case is not notably different in respect to the number of obvious neurotic traits, nor in the school or social adjustment. The special point of difference lies in the particular relationship to the parents in the past, and then to comrades in combat. Ramsey was independent and casual toward his family as a young child, and showed none of the intensity of reaction and the dependence on the mother so striking in many of the histories of other, sicker cases. In addition, there was none of the intensity of relationship toward R. shown by Alpers. Since overdependence is an important indicator of anxiety, the facts suggest that Ramsey was undoubtedly a less neurotic individual, and his reaction to his combat experience was correspondingly mild.)

CASE III

Lieutenant Philip Lister was a 26-year-old officer attached to a Marine combat force. He had enlisted in the Marine Corps when he was 18 and had recently received a commission. His record in the service was excellent.

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Lister had been in the Pacific two years. His division had recently made an assault-landing against the enemy. There was fierce resistance and many casualties on both sides. When his landing craft reached the beach, the patient destroyed an enemy machine-gun emplacement single-handed. He had received official commendation for this act. There were five days and nights of violent battle following the landings. At night the Marines were under particularly heavy tension and could not sleep. Lister stated that many men broke down under the strain. One of the senior officers of the unit did not have the confidence and respect of the men and they felt uneasy about being under his command. Yet the patient was efficient and calm at all times. He performed his duties well. He did not note any nervousness whatever. Seeing his comrades killed or wounded had little effect on him at the time. He recalled transient feelings of distress and horror, which, however, he was always able to throw off immediately. Dead Japanese aroused no emotion in him. After the islands were secured, he returned with his division to the rear for a rest. He felt confident and somewhat elated at their success. He slept well and had no dreams.

The present illness began two months later, when he learned that his outfit was to prepare for further combat. Symptoms appeared as soon as these orders arrived. He became "moody" and depressed. Gruesome memories of what he had seen returned suddenly to him. He was disturbed by recurrent visions of his friends being mutilated or killed. A persistent premonition of his own death worried him. He had spells of uncontrollable crying. At times, in surges of panic, he "broke out into a cold sweat and gasped for breath." He had much difficulty sleeping. He had an almost constant diarrhea. He thought of wounding himself so that he would be disabled. He stopped taking the routine anti-malaria treatment in the hope that he would get the disease and thus be disqualified for further combat. Soon after the onset of anxiety attacks he had an important symptom: he was surprised to find that he was developing "strong sexual desires." Since his arrival in the Pacific these ideas had not concerned him. He had been indifferent and had felt no particular sexual need. With the onset of his other symptoms, however, he began to masturbate frequently. This mystified and worried him. Two weeks before admission, the regimental surgeon noticed that he was nervous and sent him to the hospital.

Past History: The patient's mother was a "worrisome and nervous" individual, and a victim of

chronic headaches and repeated surgery. The father was "stolid and wrapped up in his business affairs." The patient felt much more closely attached to his mother than to his father. One of his sisters was "nervous and overemotional." His brothers were college graduates and highly successful in business. Although the patient, who was the youngest, was also a superior student, he did not go to college. He said: "I was the black sheep of the family and preferred adventure." His older brother offered to put him through engineering school but Lister was indifferent and vague about the future. After he was graduated from high school, he wandered around the country in his brother's car. He felt restless and dissatisfied. For a while he worked sporadically at various small jobs without sustained interest. He tried working in his father's office but soon became "bored." He was sexually very active. He said: "I was usually passionately mixed up with some older girl." He made a conquest of women but often found himself impotent. When he was 18 years old, a girl became pregnant by him and required an abortion. He stated he joined the Marine Corps at that time to avoid the unpleasant repercussions of this situation at home. However, until he went overseas, he continued to have an intensely active and promiscuous sexual life.

Lister had had episodes of "moodiness" and depression and feelings of inferiority from time to time throughout his life. Occasionally there were periods during which he felt unusually cheerful and confident. While under consideration for appointment as a second lieutenant in the Marine Corps, for example, he felt depressed and pessimistic. On being accepted his attitude changed to one of self-assurance and happiness. He has had frequent moods of extreme tenderness toward children and animals and was usually generous and kind. At times, however, he displayed a "strong temper" and in his relations with people he usually formed intense likes and dislikes. When a boy he had an "obsession for neatness." He was very careful about his personal appearance and his possessions. He was interested in collecting stamps. He recalled counting the cracks in the sidewalk when walking along the street. The number "4" was important in this ritual. He was finicky about food and his mother had to persuade him to eat. He was often unhappy as a child and ran away from home several times. After he had been punished by his father he would go and sleep all night in the cellar. He had a vivid, but affectless, memory of seeing a woman run over by a truck when he was 7. He believed his long-standing horror of blood began at that

time. Before he joined the Marines the sight of blood usually made him sick, and he has never liked to witness scenes of violence. There were frightening spells of palpitation between the ages of 12 and 15. He had numerous illnesses during his childhood. When he was sick, his mother became extremely anxious and oversolicitous. He was competitive in spirit and "showed off" frequently. He said he felt the necessity of proving his capabilities before his comrades.

Examination: Lister was a short, muscular man, athletic in appearance. He was pleasant and frank in manner but serious and somewhat depressed in mood. He was alert and self-assured. He spoke rather rapidly and there was evidence of general tension. Tremors and startle reaction were not present. He was cordial but somewhat remote in attitude. He gave the impression of having considerable dormant hostility in his personality.

He received four hours of psychotherapy. After the history was obtained, he was given pentothal but even when sufficient drug was used to cause a speech disturbance, Lister exhibited no emotion whatever. During the treatment he recited in the past tense, in a cool and detached manner, the story of his part in the invasion. He could not be induced to relive his experiences. This is consistent with the degree of his repression of anxiety as indicated by the obsessive-compulsive background. He explained his fear of returning to combat on logical and philosophical grounds, which were difficult to refute. Free-association to specific questions was then employed. With this method, several important facts were brought to light. It was learned that his fears were based on ideas of mutilation. In speaking of what might happen to him if he did return to combat, he described a vivid fantasy in which his left leg was shot off. He talked about seeing a close friend injured in this way. He said he saw himself a "cripple for life." In describing the fate of such a person, he remarked: "If you had no leg, you wouldn't have the affections of women and I couldn't bear the thought of never being able to have intercourse." (Needless to say, amputees do not necessarily have practical difficulties with coitus.) Eventually he made another important statement. He said the only fear he had before making the assault landings was that he would get hit in the genitals. He remembered wanting somehow to protect his sexual organs with his hands while landing on the beach in the face of enemy fire. He remarked: "I read an article a while ago about the Spanish Civil War. It said

one of the main fears the soldiers had was of having their penis and testicles shot off. That struck a responsive chord in me. I've always been very animal-like sexually and after we got back and I began to get jittery, my desire for intercourse grew and I began to masturbate. I counted so much on going home where I have some girls waiting for me."

Discussion: This patient suffered from much anxiety throughout his childhood. He could not seem to make a satisfactory identification with his father, who was indifferent to him. He had strong feelings of rejection. He has been extremely uncertain about his capabilities, directly in sexual and indirectly in intellectual fields. He could not compete with his older brothers; while they were successful, he was the "black sheep." His later sexual drive was certainly compulsive. He was generally obsessive-compulsive in nature and anxiety was manifested sporadically by moods of depression, in competitiveness, in feelings of inferiority, and in reactions to blood and violence. It would be important to know something about his early sexual fantasies about his sisters. His exhibitions of hostility and the vivid but affectless memory of the automobile accident are undoubtedly important. These and the horror of blood and violence suggest his continual unconscious preoccupation with problems of hostility and mutilation. His bravery under fire appears to have been compulsive in nature. The outstanding fact clearly brought out with the aid of pentothal is that the sudden onset of anxiety at the prospect of further combat was, at least in part, a castration fear. The increased sexual drive with onset of symptoms was obviously an overcompensation for this very specific anxiety. That this fear was nothing new is also clear from the history. On a brief or superficial examination this patient would probably have been judged generally free of neurosis prior to combat, and his present illness simply a sign of cowardice or, at best, of anxiety that referred only to the danger of death itself.

Fear of death in the abstract does not appear to be a major factor in the development of serious neurotic illness after combat. In such cases, the specific significance of death is invariably found to be directly related to unconscious neurotic attitudes. The idea that the "combat neurosis" is based on a primary conflict between "flight and fight reactions," or between desire for social approval and for self-preservation, would seem, to this author, an unfruitful oversimplification.

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CASE IV

Lieutenant Jordan was a 25-year-old PT boat commander, admitted to a naval hospital because he had recently been having uncontrollable fears of being killed while at sea. He had been in the Pacific for sixteen months, operating with his flotilla around Japanese-held islands. Combat conditions had been very mild and he was not in great danger. Previously, however, his division of boats was engaged in the Bizerte area at the time when Rommel was trying to evacuate his forces from Africa. Later, he was transferred to Italian waters and operations became even more dangerous. He performed creditably under fire and his boat sank several enemy ships. There was considerable tension at all times, partly because the men did not have confidence in their division commander whom they regarded as inexperienced and unstable. In October, 1942, Jordan's division attacked a convoy of German tank lighters. It was night and visibility was poor. The German ships were heavily armed, more so than had been expected. As the boats closed into the attack they were met with a withering return-fire. The Germans were using the tanks secured on the decks to increase their fire power. There was great confusion and noise. Several shells hit Jordan's boat. One of them exploded near him and a piece of shrapnel hit him in the face. He was stunned but not knocked unconscious or badly hurt. He was placed on a stretcher on the deck while they escaped and made their way home through heavy seas. They arrived in port four hours later. Jordan then spent several weeks in a hospital in Africa.

After his discharge, he awaited transportation for convalescent leave. There were several air raids at this time; when he heard the sirens, he became terrified and huddled in an air raid shelter. There was little actual danger and he never before had behaved in this way. On his return to the United States he found he was unable to relax. He was irritable and restless. He dreaded the idea of returning to combat duty. After his leave terminated he was assigned to the Pacific area. While en route to his new assignment, he was tense and apprehensive. It seemed to him that "every wave was a torpedo."

Over a period of months, when he began operations again, Jordan's anxiety gradually increased. On night patrols he constantly imagined being hit. His main fear was that his boat would be ambushed and destroyed. Although for the next year he drove himself to carry on, he gradually lost confidence in

his ability to command. He had difficulty in concentrating on his duties. He began to have indigestion. While at sea, the monotonous sounds of the boat's machinery reminded him of his long and painful ride after being wounded. When ashore, most of his symptoms would subside. Finally an accident occurred: he became confused while his boat was strafing an enemy-held beach and gave an order which almost led to disaster. His junior officer temporarily assumed command of the boat. Yet nothing was said about this and he continued with his duties. Then he noticed that his old wound began to hurt him again. He felt depressed and constantly apprehensive. He regarded himself as a failure. He was sure he would be killed whenever his boat left the safety of its own mooring. He lost weight and could not sleep well. Eventually his symptoms were obvious enough to be noticed by his division medical officer and he was referred to the hospital.

Past History: Jordan's parents were divorced when he was 12 years old. His father was indifferent to him, and unfaithful to his mother. His mother was "high-strung and nervous." The patient stated he always preferred her to his father. He had two sisters but no brothers.

He said he was always a tense and nervous person, and had frequent spells of indigestion. As a child he had had nightmares and terrors. He was afraid of ambulances and sirens. He was usually apprehensive when alone in the dark. He was sensitive and self-critical and had had a difficult time making friends. He had numerous illnesses during his childhood and was chronically constipated. There were two episodes of "acute bowel obstruction," when he was 7 years old and again when he was 15. For treatment he was given many enemas and rectal suppositories over a long period of time. These were always administered by his mother, who worried about him and paid close attention to his health at all times. He made a good scholastic record in college and law school but was very "homesick much of the time" while in college and took little interest in social affairs. He said he was a "perfectionist" and that he had always prided himself on his "intelligence and ability to control his emotions." His sexual life had been active. He had fallen in love frequently and on several occasions had been on the verge of marrying without being able to make an affirmative decision.

Examination: The patient was an attractive, alert and intelligent man but impressed one as being immature. There was no startle reaction and no tremor. He was frank and cordial but he seemed

depressed and spoke in a low voice. He talked about his experiences in a detached and objective manner. He received four hours of psychotherapy. In two treatments with pentothal, although consciously cooperative, he exhibited very little anxiety and could not be induced to "re-live" the traumatic situation. He spoke about his experiences in the past tense and was always aware of his surroundings. He remained self-analytical and curious about the mechanical aspects of the treatment. He denied that the drug had any effect on him except to make him dizzy and remarked that the treatment was simply a battle of wills. The reason for this defense probably lies in the transference situation. Under pentothal, he described the episode during which he was wounded in a melancholy voice and while doing so shed tears. The mood was one of sadness rather than anxiety. He said: "When we attacked I wasn't particularly afraid, even with all the guns going. When I got hit I lay down on the deck and groaned because I felt so damn alone. There wasn't anybody around if I needed something. They were all too busy. I thought I was going to die and I thought how sad mother would be. She would miss me terribly." (Tears.)

Discussion: This patient's family atmosphere was disturbed. The father appears to have provided little emotional support in the home. The mother was overemotional and extremely solicitous about the patient, her only son. She seemed unable to gratify her erotic needs with her husband and directed them toward the patient. Jordan exhibited much neurotic anxiety as a child. His mother's constant attention to his digestive tract and bowels set the pattern for a marked passive dependence on her. His subsequent relations with other women were indecisive and unrealistic. His notable homesickness while in college attests to his neurotic attachment to his mother. The specific reasons for this attachment could not definitely be determined. His emphasis on intellectual achievement and his pride were probably compensatory in nature. One suspects the presence of considerable unconscious homosexuality in this patient, and his resistance to accepting treatment with pentothal is probably related to this attitude. He gave the impression also of having considerable narcissistic concern. Judging from the material at hand, the trauma of the experience of October, 1942, consisted partly in its significance as a threat of loss of his mother. In dying, his only thought was that it represented an irreparable separation from her. His mood when speaking of this was one of great melancholy, as though this had actually happened. His persistent

fear of being ambushed when in his boat seems also to represent anxiety at the prospect of violent assault; en route to the Pacific "every wave was a torpedo." It would be important to inquire further into the meaning of attack to this patient. Clinically he had a psychoneurotic depression.

GENERAL DISCUSSION

For the sake of summarizing these admittedly incomplete histories, the common findings are reviewed.

The parents of all four patients were neurotic. In three cases, the father was clearly an indifferent or otherwise inadequate figure in the home. All patients had very strong emotional ties to their mother, indicative of much anxiety, and in these cases the mother appeared to play a dominant role in the development of the patient's pre-traumatic neurotic attitudes. With all four there is a strongly positive personal history of neurotic symptoms or character traits. The poor school and work adjustment of three of the patients indicates a lack of sustained interest and drive. Because of their superior intelligence, one can interpret this as being due to their preoccupation with emotional problems which partially sabotaged their intellectual life. All four volunteered for military service and made a good adjustment; all showed bravery under fire previous to the onset of the symptoms. Conscious anxiety was developing prior to the traumatic experience in the cases of Lister and Alpers. Some evidence that unconscious passive trends and feminine identification were responsible for symptoms was presented in the case of Jordan. Fantasies of attack, of inexpressible hostility and of rejection had disturbed Frank since childhood. In his case the traumatic event was traumatic because it mobilized these fantasies of desertion and submissive helplessness in face of assault. Strong reaction formations against anxiety concerning castration were seen in the case of Lister, and it was shown that his illness referred directly to this particular fear. Alpers was disturbed by a mourning reaction and much anxiety in relation to the loss of a homosexual love-object.

In the case of each of these patients it was shown that the traumatic neurosis was actually the recrudescence of a previous, latent neurosis, mobilized by the traumatic combat experience. They all had constructed tangible reaction formations against a large amount of long-standing, unconscious anxiety and these defenses had helped preserve their social adaptability until the traumatic event took place. It might be said that the experience was traumatic

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seems—produced symptoms—simply because it added more anxiety to the already brimming unconscious reservoir by touching off an old but active unconscious conflict; or conversely, that the neurotic anxiety of the patient "caused" the event to be traumatic. Failure of repression followed. In the author's experience, an event must have a special neurotic significance to the patient to be the cause of symptoms. Otherwise all men in objectively the same situation would develop symptoms, which they assuredly do not. The personal significance of the traumatic event was illustrated in the case of these patients. Nothing really new had been added. The traumatic experience did not adhere in the minds of these patients as an isolated fragment of objective reality, but seemed to "diffuse" totally through the personality, like dye through water, to add an additional burden to the already burdened defenses against anxiety.

As was first suggested by Freud, the unconscious seems to have no appreciation whatever of changes in reality with the passage of time. Neurosis develops in an adult because childhood fantasies and neurotic attitudes are still current; they apparently cannot be abolished by a dimensional time. This theory is consistent with the findings in the case histories of most psychiatrists and makes it easier to understand why the contemporary experience has such a serious effect on the personalities of many men in combat. The traumatic situation links itself immediately with old neurotic fantasies and is interpreted by the patient as a confirmation of their validity. Not only is childhood anxiety still current at the time of the traumatic event and thereafter, but also the traumatic event itself seems to remain current until perhaps some sort of cure effects the resolution of the symptoms. This is obviously because the traumatic event remains for the sick man what it was at its inception—a representation of an earlier conflict. In the minds of Jordan, Alpers and Frank, the traumatic experience was still going on even though practically all the danger had passed, because they were again involved actively in their resurgent infantile neurosis, symbolized by their combat experience. If the past and present are a single *Gestalt* to the unconscious, the startle reaction so often observed in cases of traumatic neurosis then may be a normal withdrawal to a current danger. That such a tenacious conditioned reflex is acquired at times after only one trial indicates the importance of the subjective emotional factor in its establishment.

In these four typical cases, the mechanism of the neurosis was obviously no different from that seen

in civilian life. The precipitating agent was more potent than situations the patient had commonly experienced because it was more directly related to the anxiety-laden fantasies the patient was unconsciously retaining from childhood. Yet the combat event was no more potent than any experience in civilian life of commensurate violence. The clinical appearance of any neurosis in adult life seems to depend on incoming stimuli of sufficient personal meaning to the individual patient to mobilize his pre-existing anxiety. In wartime these stimuli include not only the sudden overwhelming combat experience, but also such less drastic but subjectively significant environmental influences as fatigue, low morale or disease. In all four patients it appears that self-preservation, as a current, realistic problem, played a small role. The summation of all past experience is inevitably involved in combat neurosis.

That the traumatic situation persists in the minds of some patients with hallucinatory vividness—as illustrated by various, frequently seen, acute states of dissociation (*vide* Frank's spontaneous reenactment of the dream while under pentothal)—suggests that there has been a "withdrawal" of the personality from reality.² The mind's powers of discrimination between reality and fantasy seem to be impaired because of its preoccupation with internal problems from which position it views the world; its boundaries are not well differentiated from the environment, nor the present from the past. It ceases in part to test its true status against incoming stimuli by which it ordinarily orients itself. In that case, after the traumatic experience has induced withdrawal, any environmental stimulus may readily become a part of the personality and therefore be connected with the traumatic situation.

Hypnosis and the reaction of patients to pentothal have a great deal in common clinically, but there is no amnesia and little suggestibility with the latter. In general, the sicker the patient and the greater the conscious anxiety, the more does the response to pentothal seem cathartic. It would appear that the stronger the defenses—including neurotic transference attitudes—the less likely is the drug to expose the anxiety. It has been found that exploratory treatment of any kind becomes increasingly difficult the more remote the patient in time from the traumatic event. This is a compelling argument for immediate treatment. Although progress has

² See Kubie and Margolin: The Process of Hypnotism and the Nature of the Hypnotic State; *Am. J. Psych.*, 100:611, March, 1944.

been made, the military services have often failed to concentrate their psychiatric forces near the combat zone. Lack of early treatment may be partially responsible for the high incidence of chronic neurosis, which well may be a most serious aftermath of this war.

SUMMARY AND CONCLUSIONS

The relation of the combat breakdown to the pre-existing personality was in part demonstrated in this report of four patients who developed combat neuroses. Mechanisms involved and some theoretical considerations were discussed. It was shown that intravenous sodium pentothal, when employed relatively soon after the traumatic experience, is at times useful in uncovering subjective material otherwise difficult to find in a brief period. As to the therapeutic benefits of such techniques of therapy, return of the patient to combat duty after treatment is not in itself a safe criterion of success since he may immediately be killed or hurt or readmitted to another hospital with a second breakdown. Careful comparative studies with long follow-up by energetic and well-trained psychiatric teams working near the front might provide the answer to this important question. It is most regrettable that the military services have not sufficiently encouraged competent and aggressive organized research in the field of war psychiatry.

It has been this writer's experience that the psychiatric breakdowns of this war, like other neuroses, have to do with problems of infantile anxiety, hostility and guilt which are aroused by the traumatic situation. Guilt at killing the enemy is rare, but when it does occur it is seen to express a remorse concerning hostility which the patient has long harbored. Mourning and anxiety in connection with the loss of an unconscious homosexual love-object can be demonstrated in many cases. Anxiety at the sight of mutilating wounds through identification is often seen. Enemy assault, such as shelling, is especially disturbing to patients, who have unconscious passive feminine identification. "Blast concussion" is a very common precipitating agent of war neuroses. While little evidence of a resulting neurological lesion can be proven in the great majority of such cases, careful exploration of the meaning of the event to the patient will usually bring out that the blast was immediately interpreted as a confirmation of a specific neurotic fear, as, for example, that it is the long-expected punishment for an infantile "criminal" wish. Although a very large percentage of patients studied in the combat zone

are not aware of psychosexual disturbances, in the author's material such disturbances appear to be basic in the production of their neurosis.

The research value of the study of the combat neurosis does not now lie in preparing for the next war, since, should there be one, it is doubtful that the medical department would have much opportunity to operate at all. It lies rather in the opportunity for studies as to the nature of repression and defense, as to the value of brief therapies with the aid of drugs and hypnosis, and of the mechanisms of development of neurotic symptoms, as to the effect of anxiety upon the body, and as to whether a catastrophic event in an adult is alone sufficient to precipitate a chronic neurosis without a background of anxiety.

There is considerable reason to believe that battle nightmares and the repetitive reminiscences of combat experience which harass most patients may indeed be symbolic, although it has been written to the contrary that the dreams and many of the symptoms are uninterpretable. The combat scene is certainly a very satisfactory representation of the bloody and violent fantasies, often motivated by unconscious guilt, evidently mobilized in neurotic personalities by war experience. The most persistent sign of the combat reaction is usually irritability and other expressions of hostility, and the nightmares. In many cases this hostility may be a substitute for or defense against depression or other form of current anxiety. In others, factors in the past history can be found which indicate the presence of a large amount of unconscious hostility with which the dreams then deal. The violence against the dreamer of the manifest contents seems at times to be in proportion to the dreamer's unconscious guilt. Combat nightmares are probably anxiety dreams with the same significance as those of any other neurosis. In cases sufficiently studied it has been found that the psychological connection between the traumatic event and the patient's pre-existing unconscious problem is made immediately at the time of the trauma rather than later, even though the clinical symptoms may not be apparent for some weeks or even months.

Although the symptoms of these four patients were colored by the war setting, they represent in each case the exacerbation of an old neurosis, and their illness does not deserve a special name. In the writer's experience, such is the case with persistent combat reactions.

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REVIEWS, ABSTRACTS, NOTES, AND CORRESPONDENCE

SOCIETY REPORT

BUSINESS MEETING

The annual business meeting of the American Society for Research in Psychosomatic Problems, Inc., was held on May 12th, 1946, at the Hotel Pennsylvania in New York City.

The following officers and members of the Council were elected:

Edward Weiss, M.D., *President*
Edwin G. Zabriskie, M.D., *Secretary-Treasurer*
William Dock, M.D. (three years)
Leon J. Saul, M.D. (three years)
George Soule (three years)
Roy G. Hoskins, M.D. (two years)
Elizabeth Healy Ross (two years)
J. Murray Steele, M.D. (two years)

Continuing Council terms:

Flanders Dunbar, M.D.
Jules Masserman, M.D.
Leonard G. Rowntree, M.D.
Milton Senn, M.D.

REPORTS OF RESEARCH COMMITTEES

Committee on Cardiovascular Disease:

Edward Weiss, M.D., *Chairman*
Carl A. L. Binger, M.D.
Mack Lipkin, M.D.
Hugo Roesler, M.D.
Herrman Blumgart, M.D., *Consultant*

A conference sponsored by the Cardiovascular Committee was held in New York on December 7th, 1945, and was attended by about 25 physicians, representing the specialties of psychiatry and psychoanalysis, physiology and internal medicine. The paper, "Studies on the Nature of Certain Symptoms Associated with Cardiovascular Disorders" was presented by Dr. Harold G. Wolff and Dr. George A. Wolf, Jr. It concerned the relationship between feeling states and cardiovascular function. Efforts are being made to encourage other groups to study hypertension along similar lines; several groups are interested but no definite program has been determined upon as yet.

Committee on Cutaneous and Allied Diseases:

John A. P. Millet, M.D., *Chairman*
Harold A. Abramson, M.D.
Felix Deutsch, M.D.
Henry Michelson, M.D.
Marion B. Sulzberger, M.D.
Sadie Zaidens, M.D.
Bela Mittelman, M.D., *Consultant*
John Stokes, M.D., *Consultant*

This committee has held two conferences, one on the problem of allergy and the other on the psychosomatic aspects of upper respiratory disorders. Both these conferences proved stimulating and were well attended.

Three members of this committee (Drs. Millet, Abramson and Zaidens) presented a report on the dermatoses at the Annual Meeting of the Society on May 12th. Dr. Zaidens, in addition, is writing a paper which will summarize the

conclusions of the important work in this field, and will offer a critical summary of what has been accomplished to date.

During the past year the committee has been discussing the preparation of a complete bibliography of articles covering the field of psychogenic factors in skin disorders. The writing of a series of articles or a monograph giving a critical summary of this literature and indicating avenues of profitable research is also under consideration. As soon as funds can be secured this study will be undertaken.

Committee on Industrial Medicine:

C. Charles Burlingame, M.D., *Chairman*
George Soule, *Associate-Chairman*
Flanders Dunbar, M.D.
Hudson Hoagland, M.D.
Louis A. Schwartz, Lt. Comdr.
Edwin G. Zabriskie, M.D.

Cooperating Members

Irving Clarke, M.D.
Walter J. Couper
Sidney Garfield, M.D.
Dwight Palmer
Carl Peterson, M.D.
Boris Shiskin

Consulting Members

George Bennett, M.D.
Kermit Eby
Raymond C. Hussey, M.D.
Marion McBee
Kingsley Roberts, M.D.
Leonard Rowntree, M.D.
Lewis Sanders, Colonel
Harry C. Solomon, M.D.
Harold Vonachen, M.D.

During the past year, efforts of the Committee on Industrial Medicine have been directed at the predominant problems in industry which might be approached from a psychosomatic viewpoint.

To obtain a first-hand picture in determining the outstanding problems of concern to industry as a whole, the industrial field was reviewed and leading industrial physicians consulted. A great need for information on several problems was indicated, and literature was searched for pertinent information already available in the psychological and psychosomatic fields, with the objective of compiling and reevaluating that information and presenting industry with concrete data in reference to those specific problems.

The six main subjects which have been studied are: accident proneness, low back strain, female gynecological problems, peptic ulcers, cardiacs, and upper respiratory conditions (including allergies). Fatigue and epilepsy have been considered only in a general way inasmuch as they are already the objects of specific research being conducted by other groups.

Industry has also voiced a need for a simplified schedule of the differentiation of personality types which would be suitable for use in educating the first line supervisor and personnel interviewer in more satisfactory placement procedures.

Generalized suggestions for research on the above problems have been placed before the committee, and a card index of the sources of information has been set up in the chairman's office.

If resources were available, these problems might well be the basis for a three- to five-year program of study, but plans for initiating research have been delayed in accordance with the immediate policy of the Society not to enter into active research except insofar as the committees are able independently to raise their own funds for this purpose.

Committee on Infancy and Early Childhood:

Milton J. E. Senn, M.D., *Chairman*
Spafford Ackerly, M.D.
C. Anderson Aldrich, M.D.
Eric Homburger-Erickson, M.D.
Margaret Gerard, M.D.
Ives Hendrick, M.D.
Frances Ilg, M.D.
Edward Liss, M.D.
John Montgomery, M.D.
Marian Putnam, M.D.
L. W. Sontag, M.D.
Benjamin Spock, M.D.

The committee has not this year had its usual annual conference because of war conditions. Communication with all of the members has been carried out and it is the opinion of most that the conferences be resumed as soon as travel and other conditions permit. A resumption of these conferences is planned for the fall of 1946; the place, however, has not as yet been decided upon.

Committee on Medical Education and Fellowships:

William Dock, M.D., *Chairman*
Charles D. Aring, M.D.
Herrman L. Blumgart, M.D.
Flanders Dunbar, M.D.
O. Spurgeon English, M.D.
Roy R. Grinker, M.D.
Lawrence S. Kubie, M.D.
Maurice Levine, M.D.
John M. Murray, M.D.
William C. Menninger, Brig. Gen., *Consultant*
John Romano, M.D., *Consultant*
Edward Weiss, M.D., *Consultant*

This committee is now planning a program for fellowships, the details of which will be announced at a later date.

Committee on Obstetrics and Gynecology:

Raymond Squier, M.D., *Chairman*
F. Bayard Carter, M.D.
Flanders Dunbar, M.D.
Alan F. Guttmacher, M.D.
John Rock, M.D.
Nicholson Eastman, M.D., *Consultant*
E. C. Hamblen, M.D., *Consultant*

The Committee on Gynecology and Obstetrics has not been able to meet personally because the members live in four widely separate parts of the country. However, a subcommittee, working personally with the chairman in New York, has been actively concerned with an investigation in the Long Island College Hospital in Brooklyn. Primigravid patients in the antenatal clinic have been studied as to their attitude and emotional behavior during pregnancy and labor. The work has been done by an unusually competent psychiatric social worker, Mrs. Ruth Dyk, with the cooperation of members of the staff in Obstetrics and in Psychiatry. This project is in full progress at the time of this report.

The committee has received communications regarding a proposed project at the University of Michigan, involving a collaboration of the Departments of Psychiatry and Gynecology and Obstetrics in the psychosomatic research on a larger scale than has been attempted hitherto, intended to result in a permanent facility at Michigan. This project, as yet only outlined, is mentioned here because of its obviously great importance.

It is hoped and expected that the committee will be able to report much more substantially hereafter, once personnel and travel are normal again.

Committee on Psychological Methods and Concepts:

Bela Mittelman, M.D., *Chairman*
Margaret Brenman, M.D.
Roy R. Grinker, M.D.
M. R. Harrower, Ph.D.
Gardner Murphy, M.D.
David Rapaport, Ph.D.
Anne Roe, Ph.D.
Thomas A. C. Rennie, M.D.
Felix Deutsch, M.D., *Consultant*
Lawrence S. Kubie, M.D., *Consultant*
Kurt Lewin, M.D., *Consultant*
Harold G. Wolff, M.D., *Consultant*
Edward Weiss, M.D., *Consultant*
S. Bernard Wortis, M.D., *Consultant*

The aims of the committee are to survey, interrelate and stimulate research with the use of psychological techniques and concepts in psychosomatic medicine. The techniques that can be considered are interview technique, hypnosis, psychoanalysis, testing procedures, standardized tests as well as projective methods, either in themselves or in combination with the use of various pharmaceutical agents, and/or the simultaneous recording of changes in function and chemistry of various organ systems studied.

Some of the work of the committee was initiated by the committee members whereas other work was initiated by persons—interested in the field but not members of the committee—who came to the committee as a forum before which to present relevant problems, ideas and research in which they were interested or engaged.

To date the committee has held twelve conferences. Two main topics of these conferences have been (1) projective methods and concepts in psychosomatic medicine and (2) the problem of regression or preservation of earlier patterns of function in the personality.

The following is the list of those who participated in presentations before the committee: Jacob Arlow, Ralph S. Banay, H. Flanders Dunbar, Lenore Fabisch, Roy R. Grinker, Mollie Harrower, Camilla Kemple, Lawrence S. Kubie, Thea Stein Lewinson, Karen Machover, Florence Miale, Bela Mittelman, Ruth L. Munroe, Herbert Spiegel, Meta Steiner, Lewis R. Wolberg, Rose Wolfson.

Projective Methods: Five methods of investigation were studied: Rorschach method, figure drawing and handwriting analysis. The results obtained by these methods of investigation were compared with each other as well as with the results obtained by the clinical methods of interview, psychoanalysis, hypnosis, and observations of the person's behavior, including the patient's past history and current behavior.

Current Behavior: The methods were studied on patients with a variety of symptoms: alcoholism, schizophrenia with frontal lobe injury, rheumatic heart disease with psychoneurosis, glandular dysplasia with psychoneurosis, schizophrenia with suicidal attempt. In addition, the test results on a "normal" college student were presented, complementary

problems between an alcoholic husband and his wife, and a schizoid, psychopathic parent and her asthmatic child were studied.

The study of these methods can be conveniently divided into two sections: (a) standardization of methods, (b) comparison of results obtained by the methods.

It was found tentatively that on blind analysis (*i.e.*, the expert basing his conclusions entirely on the tests available) the results of the various methods showed an agreement in about 70 per cent of the information obtained. At times the agreement in the information was very striking. About 20 per cent of the material presented by the tests was not contradictory but represented separate contributions by the tests which could be confirmed by more careful or subsequent scrutiny of clinical material. Ten per cent was definitely contradictory.

Standardization of Frame of Reference: It was found that whereas the Rorschach method and the handwriting analysis were rather well codified at this point in their development, figure drawing analysis lacks such codification. The committee realized this and encouraged work in that direction (see below). It was further found that each of the methods under discussion had developed concepts which partly overlapped, partly were missing in the frame of reference of the other methods. A project was evolved to interrelate and define the concepts in the mentioned fields, to develop a common frame of reference and allot the proper place to each method in the total picture. This project is still under way.

The Problem of Regression or Preservation of Earlier Patterns of Function in the Personality: One conference was held on this problem. The method of investigation used for the relevant material was hypnosis. The adjacent methods were intelligence tests, handwriting, figure drawing, and Gestalt drawing performed by the same subject after he was given the suggestion that it was his birthday at various age levels. It was convincingly shown by the experiment presented that (a) there is a remarkable preservation in the individual of the functional patterns pertaining to a given age level. Thus, regressed to, let us say, the age level of 7 by the hypnotic method mentioned, the subject thinks, speaks, writes, and draws to a remarkable degree as a 7 year old child. (b) There is a remarkable preservation in this patterning of the time relation between the actual occurrence at a given age level of conflict situations and the appearance of symptoms. Thus the patient, who actually had phobias at the age of 6 may show them again when he is regressed to that age level, but not show them when he is regressed to the age levels of 5 and 7. (c) There is a continuous conflict, although varying in intensity, in this regressed state between the functional patterns of the suggested age and adult patterns. Thus, while the handwriting, figure drawing and Gestalt drawing in most respects correspond to the age level suggested, some features may be detectable which are those of the adult.

These findings raise some very important problems for further investigation, namely, what is the rôle of the various pattern organizations belonging to different age levels in the functioning of the adult? Under what circumstances do they come into evidence? How can their nature be adequately formulated in the total functioning of the individuals?

Publications: Of the researches reported before the committee, two have been published and one is in preparation: MUNROE, R. L.: Three diagnostic methods applied to Sally. *J. Abnorm. Soc. Psychol.*, 40:215, 1945.

SPIEGEL, H., SHOR, J., and FISHERMAN, S.: An hypnotic

ablation technique for the study of personality development. *Psychosom. Med.*, 7:273, 1945.

MACHOVER, K.: Personality projection in the drawing of the human figure: a method of personality investigation. (In preparation.)

Committee on Social and Cultural Problems:

Lawrence K. Frank, *Chairman*

Gregory Bateson

Hilde Bruch, M.D.

Henry B. Richardson, M.D.

Nina Ridenour, Ph.D.

George Soule

Edward Weiss, M.D., *Consultant*

Funds are now being sought in cooperation with the Caroline Zachry Institute of Human Development, the Institute of Intercultural Studies and the Kips Bay-Yorkville District Health Center to conduct a study of the beliefs, practices and patterns of child rearing among the various ethnic groups residing in New York City. It is hoped that this study will throw light on the causes of some of the illnesses and maladjustments among children and in families, and will guide various public and private agencies and professional groups in their contacts with patients and children.

Report on Proposed National Health Act: Some months ago a sub-committee of this committee was authorized to prepare a report on the implications for psychosomatic medicine of prominent proposals for health insurance or similar measures of social medicine. It was agreed that the Society, as a scientific and educational organization, could take no stand either for or against any such proposal. It would be entirely proper, however, to inform others concerning the possible effects of such proposals on the future development of medical practice from the psychosomatic point of view.

There is now before Congress the National Health Act (S1606-HR4730). A report analyzing briefly those sections of the Bill which are of particular interest from the psychosomatic point of view was made. It was further recommended by this committee to the Council that the Society should be heard, through representatives, at the Senate hearings. After the Council approved of this plan, a request was made to the Senate committee to hear Society representatives. Since the number of persons wishing to be heard was greater than time permitted, a statement was sent after telegraphic request from the Senate committee for inclusion in the record. The following subjects were emphasized as referring to relevant sections of the Bill:

1. The general concepts of psychosomatic medicine.
2. The proportion of chronic disease in the national health problem and the financial burden which it would place on public health services and health insurance unless substantial medical progress is made in reducing it.
3. The unique promise of the psychosomatic approach in reducing the amount and duration of chronic illness.
4. The importance, as a preventive measure, of psychosomatic orientation in public health work with mothers and children.
5. The need for more and better medical training and research as a means of realizing the possible contributions of psychosomatic medicine.
6. More detailed comments on the desirable administration of the measures proposed in the Bill, including such things as the composition of professional advisory committees, the organization of medical service, the coordination of the work of specialists with that of general practitioners; and methods of remuneration for medical service.

PSYCHOGENIC PERIPHERAL VASOSPASM

A CASE REPORT

EDWARD J. WEISS *

That personality and emotional factors can bring about a disturbance in the function of the peripheral blood vessels has been known for some time, but these factors have generally been held to be merely "predisposing" or "precipitating" for the so-called vasomotor neuroses. The vasospasm associated with peripheral vascular diseases has been variously attributed to such hypotheses as overactivity of the vasomotor system of diencephalic origin, local hypersensitivity of the walls of the peripheral arteries and arterioles, endocrine imbalance, and a disturbance of histamine metabolism. Despite the rather frequent observation, however, that a large proportion of patients suffering from peripheral vascular disorders show emotional instability and an intensification of symptoms following emotional upsets, the possibility of emotional and personality factors acting as sole, discoverable, causative agents has been given little consideration.

Mittelman and Wolff (4), in 1939, demonstrated that affective states can profoundly influence the skin temperature, and Mufson (6), in 1944, after a study of a series of patients suffering from Raynaud's disease, advanced the theory that this clinical entity is primarily a psychosomatic disturbance. He concludes that in Raynaud's disease "cooling of the skin is the trigger mechanism which renders complete the partial occlusion of the minute vessels which has been initiated and is being sustained by personality and social-economic derangements."

The importance of psychological factors in peripheral vascular disease seems also borne out by the recent work of Lipkin, McDevitt, Schwartz, and Duryee (3), who studied the effects of suggestion in the treatment of vasospastic disorders. They report a series of 9 cases treated by suggestion, 6 of whom showed excellent subjective improvement and some objective response. They conclude that results obtained with suggestion compare favorably with those obtained by any reported method of treatment, with the possible exception of surgery.

In that group of vascular reactions associated with trauma or infection the tendency has been,

since the demonstration by Leriche of the significance of "vascular nerves," to account for the disturbed physiology on the basis of direct or reflex irritation of the visceral nerves supplying the blood vessel walls. Nevertheless, this conception fails to account in many instances for all the observed phenomena. For example, the widespread vasoconstriction following an insignificant trauma to an extremity can hardly be explained on a simple vasomotor reflex basis, and Homans (2), cognizant of this fact, states that when a sympathetic block fails to give a complete temporary relief in such cases, "one should suspect an hysterical element in the problem."

A review of the literature, with the possible exception of the six cases of Raynaud's disease reported by Mufson (6) in which exacerbations and remissions were shown to be related to emotional disturbances, fails to reveal any case of vasospastic disease in which emotional and personality factors have been shown to be directly and solely responsible. The following case is, therefore, of interest in that it demonstrates clearly the psychogenic basis of the disturbed vascular physiology and its complete and rapid removal with psychotherapy.

CASE REPORT

A 28-year-old soldier was admitted to the cardiovascular service by litter on February 10, 1945, as a transfer from an overseas hospital because of a marked peripheral vascular disturbance of the feet and, to a lesser extent, of the hands. He had been in good health until September, 1944, at which time, while stationed in England, he noticed a bluish discoloration about the ankles. There was no history of trauma, infection, exposure to cold, or the use of ergot. During the next two to three weeks there was a gradual spread of the discoloration over both feet accompanied by considerable pain. About this time, too, the patient became aware of a mild, diffuse cyanosis of both hands which was unaccompanied by pain. He was hospitalized in October, 1944, and during the ensuing four months his condition gradually grew worse so that he became completely bedridden. After failing to respond to the usual forms of treatment for peripheral vascular disease, he was evacuated to the United States in February, 1945.

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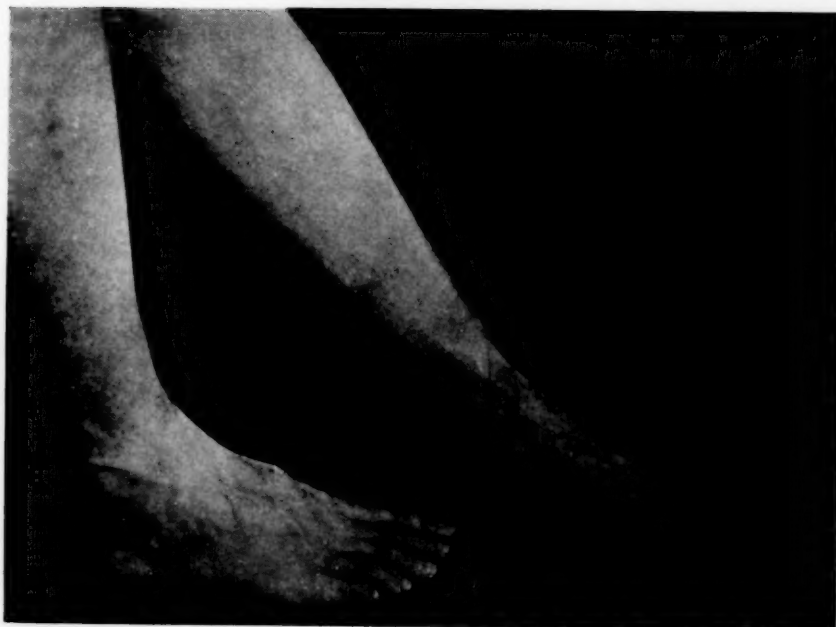


FIG. 1.—Showing appearance of feet before treatment.

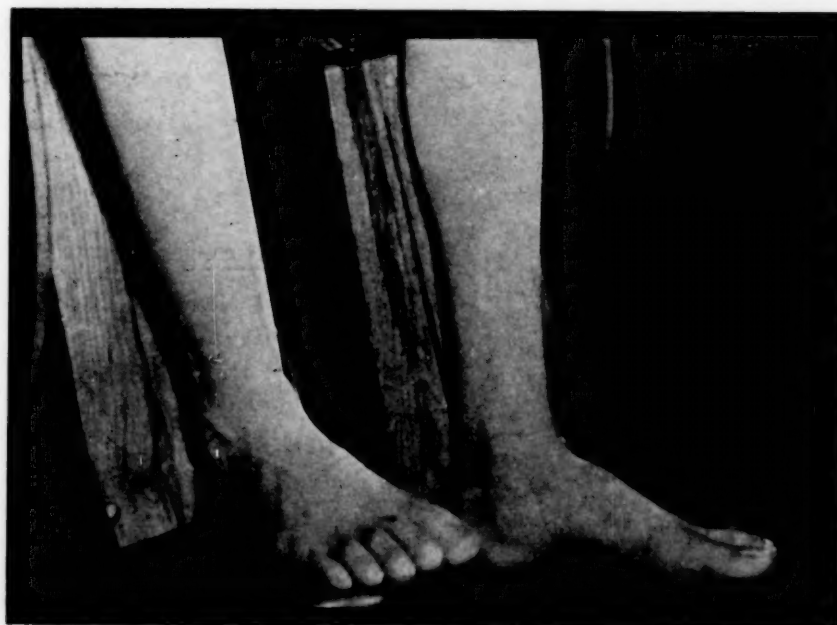


FIG. 2.—Showing appearance of feet after treatment.

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Physical examination on admission to this hospital revealed a well-developed male, confined to bed. There were no findings of note except those referable to the extremities. The hands showed a diffuse, mild cyanosis. There was marked cyanosis of both feet and ankles, most marked in the dependent position (figure 1). The skin of the feet was cold, dry and scaly, and showed an absence of perspiration. Mere stroking of the skin was exquisitely painful and deep palpation even more so, the patient complaining that it felt "as though someone were touching me with a red hot iron." There was moderate atrophy of the musculature of both lower extremities, secondary to disuse. The anterior and posterior tibial vessels were readily palpable. Skin temperatures of the lower extremities recorded a few days after admission were markedly depressed

TABLE I

SKIN TEMPERATURES OF THE LOWER EXTREMITIES
PRIOR TO PSYCHOTHERAPY

Room Temp.: 78° F.

Left			Right	
1 hour after vaso-dilation	Before vaso-dilation		Before vaso-dilation	1 hour after vaso-dilation
74°	70°	Great toe	70°	75°
73°	70°	2nd toe	70°	75°
74°	68°	3rd toe	70°	74°
74°	68°	4th toe	72°	75°
74°	68°	Little toe	72°	75°
81°	77°	Dorsum	79°	81°
82°	81°	Mid-tibial	81°	84°
82°	79°	Knee	81°	82°

and failed to show any appreciable rise after one hour of generalized vasodilation (Table I). The usual methods of treatment were instituted for a period of three weeks without any improvement in the clinical picture. A lumbar sympathetic block was then recommended but was declined by the patient, after which a psychiatric consultation was requested.

During the initial psychiatric interview the patient was sullen and hostile in his attitude. He resented the implications of his referral to a psychiatrist, protesting that he was a well-adjusted individual without symptoms of nervousness. He was mildly depressed over his condition and wondered if it might not be best to have his feet amputated since they were causing him so much discomfort. It was with considerable reluctance that he finally agreed to psychiatric treatment, stating, "Well, all right. I haven't got anything to lose. I can't get any worse."

He gave a history of having always been in good health, prior to his present illness. He was the older of two siblings and was closely attached to his parents and brother. His childhood had been a happy one, and he could recall no neurotic tendencies during that period of life. After completing two years of college, he became interested in transportation work and operated an interstate trucking company for six years before entering the army in 1942. He liked people and made friends with ease. He was stationed in England for some time in a non-combat assignment, which he enjoyed. During this time, he fell in love with an English girl, whom he married after a courtship of three months. He stated that his marital life was extremely happy and sex relations were "quite satisfactory."

Active psychotherapy was begun March 12, 1945, at which time the patient was placed in a state of hypnosis by means of visual-auditory stimulation in the usual manner. The deep level of hypnosis reached was indicated by the patient's responsiveness to motor and sensory suggestions, as well as by the complete amnesia for the hypnotic period on awakening. Because of the hostile attitude previously displayed, he was encouraged while in this state to reflect upon any feelings of hostility he might have had during his army career, especially just preceding the onset of his present illness. He then related the following story: One day in April, 1944, about three months after his marriage, his wife visited him at the post and then boarded a bus to proceed to her home. The adjutant of the patient's organization happened to be a passenger on the same vehicle and during the trip persisted in making advances to the patient's wife, who became very much annoyed and reported the incident to her husband when he returned home that evening. The intense emotional reaction which this engendered in the patient is illustrated by the following verbatim report of the interview:

Q. How did you feel about it?

A. I saw red. I had a cold tremor go through me. That is one thing I don't tolerate, having my wife or mother insulted.

Q. If the adjutant had been there at the time, what do you think would have happened?

A. If I had seen him at that moment, I believe I would have lost control of myself. Sometimes it worries me to think what I might have done.

Q. Do you mean you might have used physical force on him?

A. That's possible, but I hate to think about it. He deserved anything.

Q. What sort of physical force might you have employed?

A. I would have used fair means or foul means.

Q. What do you consider foul means?

cleared as a result of one week of intensive psychotherapy.

(2) Apparently psychogenic factors not only may play a role in the course of peripheral vascular disorders but may also be the sole discoverable pathogenic agents in some vasospastic disorders.

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THE PSYCHOSOMATIC FACTORS IN ULCERATIVE COLITIS

A CASE REPORT

DON D. JACKSON, M.D.*

Since the studies of Alexander (1), White and Jones (8), and others, the psychological factors in the production of mucous colitis have been carefully evaluated. However, although most clinicians have appreciated the psychosomatic factors in so-called idiopathic ulcerative colitis, there has been almost no etiological significance attached to this aspect of the disease. There are numerous theories describing etiological factors, most of which have their bases in allergic phenomena, but it is possible that the end result clinically can be produced by heterogeneous etiological factors. Doctor Edward Weiss (7) feels that the initiating factor in some of these cases may be psychogenic, since there are all gradations of severity in ulcerative colitis. Murray (4) wrote the first paper on the psychological problems of ulcerative colitis, and this was followed by Sullivan's (5) paper in which he showed at least 60% of his cases to be on a psychosomatic basis. There has not been sufficient attention delegated to these articles.

The following protocol illustrates, more clearly than most, the etiological significance of psychological factors in certain cases of ulcerative colitis.

The patient, Mrs. A., entered the hospital in July 1944. She had had a sudden onset of bloody diarrhea, occurring three to four times a day, in April. This lasted a week, and recurred in June with six to ten bowel movements daily. She saw her private physician at this time, and was hospitalized a few weeks later. She had recurrent episodes of stiff, swollen, painful joints. In the three months before

her transfer to Stanford Hospital, she had lost 22 pounds in weight.

On entry she was a thin, very pale, young woman who was obviously tense and anxious. Physical examination revealed that her abdomen was tender, and her shoulder and ankle joints were stiff and painful. Her hemoglobin was 50% Sahli, with 3.6 million red cells, and a white count of 9,000 with a normal differential. The urine, blood Wassermann, blood agglutinations and culture were normal. The stool was liquid and grossly bloody, but no parasites nor pathogenic bacteria were isolated. A Frei test was negative, and an allergic survey revealed no sensitivities. X-ray studies revealed a large, smooth, ("lead pipe") atonic colon with no haustrations. Proctoscopic examination to a distance of 24 cm. showed friable, bleeding mucosa with many small ulcers. The diagnosis of "idiopathic chronic ulcerative colitis" was made.

The patient was treated supportively with transfusions, iron, vitamins, sedatives, bismuth, and paregoric. She was dismissed after two weeks with instructions to receive further care in the neuro-psychiatric clinic.

She was interviewed three times a week for the first two months, once weekly for two additional months, and is now being followed every two months.

Mrs. A. was a cooperative, intelligent and attractive woman, but during the early interviews found it very hard to talk about herself. After giving the initial history, it was only by making use of her rather extensive dreams that we were able to bring up new material.

Her mother died when she was 3, and the patient

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had no memory of her although the family spoke about their wonderful and beautiful mother; the earliest memories of her father all related to how kind and affectionate he was. When she was 4, however, she was entrusted to the care of a fat, motherly housekeeper and saw very little of her father. She had never known how to account for this change, but its effect on her was marked.

When Mrs. A. was 10 her father remarried. Despite her father's constant pleas, she was always quarreling with her new, domineering stepmother. She received no affection from this woman.

Besides the nagging of her stepmother, there were her sisters to cope with. The oldest was nine years her senior—a quiet, unfriendly person. The twins were seven years older than she, and were noisy and constantly criticizing: "her nose was too long," "she was too quiet," "she ate too fast," etc.

The patient thus had no real affection, and no one to be dependent on. She became quiet and spent hours lying on her bed, imagining that she was a princess or some other famous personage.

Neither her father nor stepmother ever discussed sex with her. She had several episodes of sex-play with other children when she was small, but never masturbated although she had heard about it. Menstruation was something of a shock.

Her school period was unremarkable. She always did well, was shy but had a few friends, and never went out with boys. At college she became a little more outgoing so that in her senior year she had "dates" and did some petting. Just before graduation, she met a tall, handsome Navy Lieutenant. They went out a few times before he left for sea duty, and she carried on an active correspondence. When he returned in six months they became engaged, and were married during his next two weeks' leave. She felt that she was in love with him, yet envied his being more extroverted. She "enjoyed" intercourse but never had an orgasm; often she would lie awake frustrated for hours afterwards. They had only two weeks of marriage when he left for sea, and her diarrhea began about two weeks after his departure.

She entered treatment willingly because she had realized that her diarrhea was associated with her emotions.

The major problem in therapy was to uncover the hostility that lay under the cloak of an "if I am good they will love me" attitude. Her hostility toward the stepmother and sisters was intense, but toward her father she unconsciously maintained an ambivalent attitude. However, an excerpt from a dream late in the treatment indicates the change brought about:

"I was a sentry on duty, and a car approached with a man and three women in it. I shot the women, then the man, and put down the gun as I felt I had done enough killing."

The first recurrence of diarrhea was during the second month of therapy. She had spent a night at the home of her sister and was awakened by an attack of diarrhea. This ceased after she spent the next interview ventilating hostility against this sister.

A month later a young man moved into her apartment house, and they met several times through mutual friends. He planned a weekend date with her and during the intervening days an attack began which suddenly ceased when the date was culminated. There had been conflict over wishing to spend the night with him, and it was resolved when she invited him to sleep with her.

After this experience she was a different person. She had poise and confidence, spoke more freely, and took an interest in social affairs. The young man left shortly after, and she made no attempt to correspond. He was merely a passing fancy, someone with whom she "acted out."

The patient began to look forward more and more to her husband's return. She had a practical view toward the difficulties that might arise—was no longer idealizing.

During the period from August to January she gained 20 pounds. On January 9, 1945, her hemoglobin was 85% and she had been having one or two bowel movements daily for three months. A barium enema at this time was reported as follows:

"Haustrations are now pretty good in the transverse colon where the disease appeared fairly extensive in the previous studies, where the mucosal pattern also appeared affected."

"Conclusion: Remarkable improvement since previous studies."

FURTHER HISTORY

In February, her husband returned and to her astonishment asked for a divorce. He claimed that he had never really loved her and that the war had changed him. Within a day, another attack of diarrhea and bleeding began which terminated ten days later with her decision to grant him a divorce. She also seemed to gain in self-assurance from this trying situation, and needed almost no help from the therapist in gaining an understanding of how she had placed herself in this situation by overlooking obvious incompatibilities before she married.

There have been no further attacks and she has been successfully completing a postgraduate education. Her physical condition is good.

COMMENT

It is not the purpose of this report to make claims for the efficacy of psychotherapy in ulcerative colitis. However, one cannot read this history without being struck by the cause and effect relationship of emotion and the attacks of bloody diarrhea. It is also of interest that the rather remarkable (for this disease) improvement of the colon and the patient's general health paralleled the improvement of her psyche. This is in accord with Daniels (2), but her medical therapists continued to hold out for an "allergic" basis. The psychiatric factors assume greater importance when the nature of the precipitating stress and the patient's personality are compared. Mrs. A. was an emotionally immature woman with a great deal of insecurity and repressed hostility. The attacks of diarrhea occurred when situations arose that threatened her security and aroused her hostility. The initial attack, for example, began when her marriage was threatened by her husband leaving for sea duty, and when she

was unconsciously angry with him for "leaving her" (3).

SUMMARY

A case of ulcerative colitis is presented, and the patient's life history is discussed to show the relationship between her emotions and her disease. It is felt that relegating the emotional factors to merely a secondary role is not justified in this case.

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SEMINARS IN PSYCHOSOMATIC MEDICINE

The Committee on Psychosomatic Medicine of the New York County Medical Society has announced its plan for a series of seminars on psychosomatic medicine to be held on six successive Wednesdays, beginning October 30th, 1946, at 5:00 p. m., at the Academy of Medicine.

Dr. M. Ralph Kaufman, Chief Psychiatrist at Mount Sinai Hospital, will preside at these seminars; the lecturers and discussion leaders will be announced at a later date. The specific topics of each session will be as follows:

- October 30—Emotions and Bodily Change
- November 6—The Dynamics of Personality
- November 13—Techniques of Psychotherapy in Psychiatry
- November 20—The Transference Relationship
- November 27—Psychotherapy in Medicine and the Specialties
- December 4—When to Recommend Psychiatric Consultation

Admission to this series will be by registration only, with the total registration limited to 50 and restricted to members of the New York County Medical Society. There will be a registration fee of \$15.00 to defray the cost of the meetings and to provide for publication, if desirable.

Members are invited to register at any time up to October 1st. Checks should be made payable to the Medical Society of the County of New York and forwarded with application for registration to the Society, at 2 East 103rd Street, New York 29, New York. Early registration is suggested.

REVIEWS OF PERIODICAL LITERATURE

SALERNO, E. V., AND SALA, S. L.: *Psychogenic Factors in Gynecology and Obstetrics. Spontaneous Emotional Abortion*. Rev. de la Ass. Med. Arg., 60: 109, 1946.

Psychic influence generating a morbid state is seen in the following case. A woman of 37 years, married for ten years, went through 8 unsuccessful pregnancies. The first was terminated by a therapeutic abortion because of severe hyperemesis. The second ended in a spontaneous abortion in the second month. The third ended the same way. The fourth ended with spontaneous abortion after a little more than a month, following an upset with the family. The fifth was interrupted in the sixth month, after periods of irritability, depression and vomiting, following an accidental fall. The sixth was accompanied by marked sympathico- and vagotonic symptoms. Intensive specific treatment (bismuth and neosalvarsan) was given. Signs of intoxication appeared and in the eighth month, after an emotional "shock," a child was born which survived for two days. In the seventh pregnancy there was vomiting, pyalism, hyper-irritability, nervous tension, and depression. Specific treatment was repeated. Family disturbances then occurred and in the seventh month labor set in. The physician accelerated the expulsion and a fetus was delivered which had died shortly before birth. The eighth pregnancy ended after two and one-half months, following a family quarrel. Dr. Salerno, who at that time first saw the patient, tried progesterone and Vitamin E without success. When the patient became pregnant for the ninth time, Dr. Salerno made a most detailed clinical and laboratory investigation of husband and wife, with negative findings. He started then a careful psychoanalytical investigation that brought out a series of unconscious infantile psychic trauma and obsessional thoughts, as follows: the death of a brother during her early childhood, the "bad milk" she had from her mother at that occasion, repeated memories of being bitten by a duck, the terrifying vision of a brother being in an accident when she was a child, the surprising appearance of her first menstruation, and later her disharmony with her sister-in-law and the continuous anguish caused by this; episodes of insomnia, palpitation and depression, the deep affective repercussion of conflicts among others, envy of children of others, etc.

Her neurotic manifestations became intensified during pregnancies and she herself stated that "she never would have a living child because she becomes emotional easily and that makes her lose the child." In the seventh month Dr. Salerno sent the patient to Dr. Sala for obstetrical care. Dr. Salerno had already initiated psychotherapy and abandoned all medication. This régime was continued and the pregnancy was terminated successfully with the birth of a child of 3250 gm.

Discussion: Although the influence of somatic disorders on the psyche is generally accepted, there is still resistance to accepting an influence of the psyche on the soma. Recently, however, the concept of unity of psyche and soma, and interdependence of those two spheres is more and more recognized. If we accept it *a priori*, this is the chain of events: psychic disturbance, somatic manifestation and the way of conduction.

1. Somatic effects:

(a) In general medicine, respiratory, vascular and intestinal phenomena are seen. Cannon's, Graefes' and Pavlov's work deal with the influence of emotion on physiology and physiopathology. Graves' disease and gastric ulcer are of special interest from this point of view.

(b) In gynecology, psychogenic menstrual disturbances, war amenorrhea, imagined pregnancy, and other manifestations are observed. Carcamo and Langer group here present certain cases of sterility on a basis of "conversion of the type of pregenital fixation or regression, or of inhibitions constructed around the Oedipus complex, or of hysterical type."

(c) In obstetrics belong the imagined pregnancy, the superstition of "bad luck," psychogenic vomiting and emotional influences of the environment during labor. Even the amount of pain during labor is, according to some, psychically determined.

(d) In spontaneous emotional abortion, emotional factors, even if not accepted by many, are not absolutely denied by any worker in this field. There are many examples in the literature how fright favors spontaneous abortion.

2. Emotional components or factors:

(a) In referring to general medicine, Carcamo and Langer state: "Psychoanalytically it can only be reaffirmed that the basis of conversion phenomena is constituted by a repressed psychic charge. They are formed by somatic innervation and the choice of the symptoms depends upon the constitution and the type of psychic trauma suffered by the patient."

(b) In obstetrics there may be many types of psychic emotional factors, "accidents," undesired or illegitimate conception, economic, physical or psychic incapacity for maternity, insufficient psychic preparation, etc.

(c) In spontaneous psychogenic abortion on a conscious level the personalities always have a neuro and psychic lability, but many more factors are to be found in the terrain of the subconscious.

3. The conversion phenomenon in obstetrics and spontaneous emotional abortion. In regard to the way of conduction of stimuli, Walthard's theory seems to be the one in vogue. Peripheral vasodilatation following psychic stimuli is in turn followed by central vasoconstriction, including the region of the uterus. The presence of progesterone in pregnancy may prevent this

defense mechanism by inhibiting contraction of the smooth muscles of the vascular walls and hemorrhage may follow. But these are only theories and this explanation does not seem sufficient. (O.P.)

LEBLOND, S., AND VOYER, V.: *Clinical and Psychiatric Study of Hypertension*. Laval Med., 11:393, 1946.

Psychic influences in hypertension have been long recognized. Three different situations have attracted medical curiosity.

(1) The overlooking in the Army of slight hypertension without symptoms. Many were sent back after months with "chronic anxiety or emotional instability."

(2) The thousands of certificates by family doctors, made to protect recruits not suited for military service, with the diagnosis of cardiac disease without organic findings. Almost generally at induction they were sent back for well-established neurotic troubles.

(3) Dancey and Ross found that French-Canadian recruits, in proportion of 5 to 2, complained more frequently of heart symptoms as compared with recruits of other ancestry. Many stated that they had taken digitalis since puberty.

Clinical study: Hypertension is accompanied by so many neuro-vegetative symptoms that one may ask whether hypertension is not itself a neuro-vegetative phenomenon, like color change, palpitation, etc. Nineteen hypertensives, 20 to 35 years of age, with BP of 150 to 180 over 100 were observed. One other was 44 years of age. Their complaints were about the same: pain in the heart region, palpitation, dyspnea at excitement or overexertion, often without reason, capricious appetite, irregular sleep. They had had their symptoms for several years, followed the military routine poorly, and were frequently on sick call. Their symptoms diminished or disappeared at rest, and the BP was very variable. All clinical and laboratory examinations gave normal findings. No organic reason for the high blood pressure was found.

Psychiatric examination: Particular interest was taken in the way the patients described their troubles. In 5 the father or mother died from heart trouble when they were still children. Many mentioned nervous disturbances, especially among their sisters. None had over eight years of school. One gave up college because he could not adjust to group life. Almost all suffered in their childhood from allergic or pulmonary affections. Most engaged little in sports. They were very dominating, as was also seen in their family life. They tended to stay near their families. Those from cities chose occupations well below their physical or mental abilities. As for early neurotic traits, none of them had suffered from enuresis but all had tantrums or impulsive traits. Some were potentially alcoholic, this being often the only circumstance under which they had sexual relations. They paid extreme attention to everything in connection with their heart.

Psychological corollaries. The slight hypertensive does not exteriorize a gross neurosis. This was ignored for a

long time in psychiatry. But on studying the patients' remarks, one may think of the hypertension as the main external sign of the neurosis.

They all had average or a little below average intelligence. They were hypersensitive and could not take school milieu for long periods. Frequently there was only one parent. They learned to keep their emotions to themselves and to suppress them for long periods. Often they were traumatized by the physician's remark about familiar predisposition for cardiac affections. They never expressed openly their emotional or sexual problems, and avoided emotional contacts. They avoided competition. Their emotional allergy often manifested itself in physical allergy. They had nightmares and often anxiety states. In summary the hypertensive is allergic to integration into the group. In the army where group work is essential, he therefore has exacerbation of his hypertensive allergy.

Psychosomatic pathogenesis: Cannon found that the somatic reaction to anger or fear consists in increasing its preparation to meet the emergency. But here there are temporary reactions without chronic physiologic disturbances. Pavlov and Popof contributed to the answer to the question of chronic changes in their work on conditional reflexes.

Therapy: Rest: By rest the BP went considerably down in the patients but the other neurotic manifestations changed little.

Psychotherapy: Frank discussion of the emotional traumata, going back to childhood, had a beneficial effect on the anxiety and other neurotic manifestations. Twelve patients were released from the army and 8 used for limited service. Six of the 12 continued with their complaints in civilian life.

Chemotherapy with phenobarbital and psychotherapy was used to establish quicker rapport. (O.P.)

CONNELL, W. F.: *Hypertension*. Can. Med. Assn. J., 54:348, 1946.

There are approximately 60 conditions in which hypertension may appear. These, however, account only for 5 percent of all cases, the rest being labeled as essential hypertension.

In essential hypertension, the patients as a group show a nervous hyperactivity, sometimes inherited, sometimes aggravated by childhood training and precept.

Before the work of Goldblatt, Page, and others, the vasomotor system was thought to be overactive in some persons for long periods of time, with increased peripheral vasoconstriction, leading to hypertension. Goldblatt, Page, and others put more emphasis on a humoral mechanism, almost leading to the discard of the neurogenic theory. Today it is thought that much clinical hypertension is set in motion by neurogenic mechanisms but that important humoral mechanisms then step in. This view was developed by Page in his recent writings. According to him the processes leading to hypertension may be thus classified:

(1) Simple vasomotor lability.

(2) Pre-hypertensive group. Vascular hyper-reactivity to oxygen deprivation or immersion in ice water is manifestly evident. There may be many in this group who develop permanent hypertension, often accompanied by evidence of psychological and autonomic nervous upset—

(3) This forms the basis for the concept of an at least primary neurogenic hypertension.

(4) In early essential hypertension, renal excretory function may remain normal while renal hemodynamics are very much disturbed. In these cases pressor factors start and continue to circulate in the blood stream.

"We must recognize that most of our hypertensives become so through their reactions to their environment, to the stresses and strains of life in general. Their nervous systems are highstrung, hair-trigger. They are most of them hyper-conscientious worriers, who feel guilty when they are not doing something, who cross their bridges before they come to them, and who generally take life far too seriously."

Prognostically, the older age group, in whom it is often an accidental finding with no symptoms, gives a better outlook. The most unfavorable cases are the young in whom the diastolic pressure becomes fixed at a high level rather early. Between those two groups fall the majority of cases with a course of ten to fifteen years and later death from some complication. For the evaluation heart, eyegrounds and urinary tract always should be carefully studied.

In treatment, readjustment of the patient is most important. If the patient has symptoms one should always ask himself to what they are due.

Frequently there is fatigue, palpitation and vague pains, and dullness of the head. These are symptoms rather of the chronic anxiety state which very frequently accompanies hypertension. Here the nervous tension, not the high blood pressure, should be treated. "A high blood pressure neurosis can be just as disabling as a cardiac neurosis. . . ."

Among drugs the only valuable one is potassium thiocyanate, but this should be reserved only for the patients with really severe head aches, and their subgroup with tinnitus and vertigo. It never should be employed in patients over 60 or with gross complications. Another group are the patients with about 115 mm. diastolic pressure, who do not seem to hold their own on repeated rechecks.

The Smithwick operation seems to slow the course, at least, of in, up to now, hopeless cases. But only long follow-ups will enable us to see its real value. Not much has emerged so far in regard to renal depressor substances, but it is hoped that from this biochemical approach will come the final solution.

"Let us realize that much of the therapy of these patients is really psychotherapy, conscious or unconscious, and let us see to it that it is good psycho-

therapy." "In conclusion, let us always remember to treat the patient, not his blood pressure level." (O.P.)

NICHOLSON, W. M.: *Emotional Factors in Obesity*. Am. J. Med. Sci., 211:443, 1946.

Obese persons like to hear that they have gland trouble, and want to be treated with medicine. Often the physician complies with this wish.

In obesity the energy intake exceeds the energy output. Decrease of energy intake should be considered as the most feasible means of treatment. The calculated diet ranges from 500 to 1500 cal., but failure is quite frequent using only this therapy. It has been emphasized that desire for excessive food intake is based on a disturbance of the psychological make-up. The present study was made to evaluate the use of psychotherapy. Ninety-three patients were studied. Their primary complaint was obesity or nervousness and frequently there were present hypertension, menopausal disturbances, etc. The patients received a complete physical and laboratory work-up on admission and were checked up at each visit. Four groups were formed:

(1) In 38 patients, a detailed history was taken, considering all factors that might have had an influence on their personality. The superficial psychotherapy consisted in reassurance and interpretation, especially of metabolism. No medication and no calculated diet was given.

(2) Thirty-five patients received a calculated diet of 800 cal. No psychotherapy or medicine but only detailed information about food and metabolism was given.

(3) Ten patients received 5 mg. of amphetamine sul. t.i.d. No psychotherapy or calculated diet was given.

(4) Ten patients, similar to group 3, received thyroid substance instead of amphetamine.

Results: In each patient it was possible to demonstrate some emotional problem. Varying degrees of tension states chiefly were found. Others had anxiety attacks. Sometimes definite compulsive obsessive neuroses were found. The most frequent precipitating cause was worry over a member of the family in the armed forces.

Two case reports illustrate the points brought forward.

The author's statistics show, in agreement with the findings of Danowsky and Winkler, that a very high percentage of patients treated with calculated diets only are to be considered as failures. In the group treated with psychotherapy alone, the failures were considerably fewer.

If given drugs, the patient relies upon them rather than upon himself.

In conclusion the author states that reestablishment of proper food habits, together with psychotherapy, are essential for permanent weight reduction. (O.P.)

BAYER, LEONA M.: *A Psychosomatic View of the Soma*. Stanford Med. Bull., 3:93, 1945.

Much psychosomatic research is so concentrated on relating a patient's psyche to his disease that it tends to overlook the patient himself. This paper focusses attention on the physical constitution, which might help in finding clues to the possible origins of psychosomatic disease. Somatic constitution may be connected with disease in various ways.

(1) The somatic variation is the disease (e.g., spine bifida, splenic anemia).

(2) The somatic variation is genetically linked with the disease, as slant eye with essential idiocy in Mongolism.

(3) The somatic variation is the result of the disease, as dwarfism in thyroid deficiency.

(4) The somatic variation is the mark of being more prone to the disease, as has been described for phthisis in the long, slender type.

(5) The somatic variation leads to secondary personality disorders through its social effects, as in crippled veterans, slow-maturing boys.

(6) The somatic variation reveals certain imbalances within the constitution which may lead through personality disturbances back to secondary physical changes.

The latter three mechanisms imply psychosomatic as well as physical mechanisms and this paper concerns itself mainly with these.

It is necessary, in order to find such relations, to make some kind of dynamic approach to the appraisal of constitutional studies, like those of Draper and Sheldon which seek to embrace the total constitution. A somewhat different concept is to understand the somatic equilibrium rather than to describe a status. After establishing incongruities in the harmonious function of the body we will look for repercussions of these in the psyche.

The ordinary medical examination appraises mainly the survival potential. Frequently it also takes cognizance of the patient's sexual potentialities. The concept of energy level enters both factors and what really would interest us is the quantum of psychophysiological as well as physical energy with which each individual operates.

In hyper- and hypothyroidism the relation appears simple. But a neurotic may appear of low vitality because his inner conflicts are cancelling the effectiveness of his different antagonistic drives and so little vitality appears to be left.

This hypothesis is proposed: Those individuals will be particularly prone to psychiatric or psychosomatic illness who have significant disharmonies between any of several aspects of their somatic constitution, or between their somatic equipment and their environment. The physical constitution can thus often give the clue

to possible sources of psychological conflict. Several clinical examples are given to illustrate this line of reasoning. (O. P.)

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BOOK REVIEWS

ALEXANDER, FRANZ, AND FRENCH, THOMAS: *Psychoanalytic Therapy*. New York, Ronald Press Company, 1946, 353 pp. \$5.00.

The staff members of the Chicago Institute for Psychoanalysis have collaborated in the production of this provocative report of the results of the application of psychodynamic psychology to psychotherapy. It "is addressed to psychiatrists, psychoanalysts, psychologists, general physicians, social workers, and to all whose work is closely concerned with human relationships." The findings are based on the treatment of 292 Institute patients and of an almost equally large number of patients seen in private practice. Twenty-one cases, all successfully treated, are presented to illustrate the principles and application of "psychoanalytic therapy." There is no report of a statistical breakdown of the total number of approximately 600 patients treated. As a result, correlations between diagnosis, therapeutic results and treatment technique are not available. This omission is particularly regrettable since the form of psychoanalytic therapy so effectively described in the book is continuously contrasted with "classical" or "traditional" psychoanalysis, frequently with the implication that the latter procedure would have led to insoluble transference complications or was uneconomic from the point of view of time and expense.

The basic thesis of "psychoanalytic therapy" is the conviction that psychoanalytic psychology had reached a stage of development which justified its active application in treatment by properly trained psychiatrists. Traditional psychoanalysis is regarded as a combined investigative and therapeutic technique which, in the fifty years of its existence, has resulted in the accumulation of a systematic knowledge of psychiatric diagnosis, dynamic psychology, psychic structure, and therapy. The authors feel that the incidental investigative aspect of psychoanalysis can be dispensed with, thus isolating the therapeutic component. Added to this is the concept of limited therapeutic goals based on a dynamic definition of mental health.

In practice, the therapist interviews the patient and formulates a plan of treatment based on his construction of the dynamics and etiology of the illness, the "ego strength" and finally the therapeutic objective for the given patient. The treatment is regarded as "flexible" in that every element in the relationship between the patient and the dynamically oriented therapist is purposefully varied in accordance with the preconceived plan. The variables are frequency, duration and intervals of treatments; position of the patient; activity of the therapist; situational adjustment of the patient's life outside of consulting room; consultation with individuals bearing on the patient's difficulties; timing and depth of interpretation; use of drugs, etc. This energetic manipulation is intended to facilitate the production of the conflictual material on which the therapist wishes to focus attention and concentrate his interpretations. In the conception used by the authors this consti-

tutes "control of the transference relationship." By these means the patient is re-exposed "under more favorable circumstances, to emotional situations which he could not handle in the past." Through the support of the therapist, this re-exposure becomes a "Corrective Emotional Experience suitable to repair the traumatic influence of previous experiences." The therapist can control the re-exposure either in the transference relationship in the consulting room or in the daily life of the patient.

In the 21 illustrative cases, the therapeutic objectives were achieved in 2 to less than 100 interviews within a period of time ranging from days to eighteen months. Although the therapy is "etiologically oriented," the diagnostic terminology used is descriptive and bears no relationship to the etiology defined in the case. For the most part, patients with psychosomatic and neurotic reaction types are presented.

The cases were carefully selected to illustrate the theoretical and technical practices of the authors, described above. This naturally leads to an examination of some of their operational concepts and of their conclusions. Of these there are many that merit discussion, but only a few will be commented on.

The term, "psychoanalytic therapy," in the sense used by the authors is open to some critical objections. They present a form of brief psychotherapy, guided in part by psychoanalytic psychology, which they take pains to differentiate from classical psychoanalytic treatment. Their definition of psychoanalysis follows: "Any therapy based on psychodynamic principles which attempts to bring the patient into a more satisfactory adjustment to his environment and to assist the harmonious development of his capacities." The crucial phrase is "psychodynamic principles." No concept of psychic energy is systematically stated or utilized except by implication, by reference to Freudian psychoanalytic psychology. Waking suggestion, cathartic hypnosis, "common-sense," can in selected cases achieve the therapeutic goals stated in the definition, and can be expressed in Freudian psychodynamic terms. They are part of the data and phenomena which are systematically embodied in psychoanalytic psychology. In this sense any psychological observation justifiably can be included.

It is disconcerting to read first that psychoanalysis (Freudian) is indicated for severe and chronic neuroses, and characterological problems; and then to learn that this treatment may be unjustifiably prolonged, not interrupted at the right time and may become a safe substitute for life experiences. Psychoanalysis is a therapeutic method. It is the practitioner who makes the errors pointed out in the book. A critical attitude is taken towards classical psychoanalysis on the grounds that it is rigid, frequently impractical, time consuming, insufficiently concerned with the patient's life outside of his treatment hours, and unsuited for large scale application. Particular exception is taken to the han-

dling of transference phenomena. Again the confusion of categories occurs. Do the authors criticize psychoanalytic psychology or the practitioners of Freudian analysis?

Therapeutic psychoanalysis (Freudian) always deals with the realities of the patient's situation, constantly tests the ego strength and almost quantitatively estimates reality adaptation. It is the permissive neutrality of the analyst (Freudian) with the resultant frustration of the patient's drives that facilitates the full play of transference behavior on the part of the patient. Any other response on the part of the analyst tends to fixate the transference. If this occurs in a form which makes the patient amenable to suggestion or common sense, psychotherapy can continue, but it is no longer psychoanalytic (Freudian).

"The recovery of memories . . . is not the case of therapeutic progress, but its result. . . ." This would seem to be only partly correct. The recovery of one memory facilitates the lifting of the repression of another memory. It is more accurate to describe the process as that of a chain reaction in which one step initiates the other when the required conditions are present, *i.e.*, solution of resistances and defenses.

The authors extend the contributions of Ferenczi and Rank in that they emphasize the emotional training (Corrective Emotional Experience) as being the essence of psychoanalytic therapy. However, they depreciate the rôle of "the intellectual genetic understanding of the sources of the patient's symptoms." Yet through "psychoanalytic therapy" the patient is made aware of repetitive patterns not only in his current life situation but also in his past. If the term, genetic understanding, is limited to the recovery of the infantile neurosis via analysis of every subsequent transformation of that pathological situation, then an ideal and rarely achieved condition is defined.

If the book is examined apart from the controversial issues it raises, the 21 cases are excellent examples of psychotherapy. The psychoanalytic knowledge and experience of the authors are expertly modified and applied to the solution of the overt symptomatology of these selected patients. One can only agree with their contention that not all sufferers of mental disease necessarily require psychoanalysis (Freudian).

At all times the treatment situation and the type of therapy used should be based on diagnosis, etiology, the patient's potentialities, and circumstances, and the orientation of the therapist.

SIDNEY G. MARGOLIN

FENICHEL, OTTO: *The Psychoanalytic Theory of Neurosis*. New York, W. W. Norton and Company, Inc., 1945, 703 pp. \$7.50.

Wherever Otto Fenichel lived—whether in Vienna, Berlin, Oslo, Prague, or finally in Los Angeles—he taught psychoanalysis. He had been a staff member of five psychoanalytic institutes and he gave lectures to almost every psychoanalytic group in the world. As he states in the preface to his last book, "The Psycho-

analytic Theory of Neurosis," he was early interested in covering the field of clinical psychoanalysis in one text book. For twenty years he collected the material, striving for complete coverage of the field. The present book is the result of this labor. It is intended to be a systematic and comprehensive teaching aid for the training of psychoanalysts. It is broader in scope than his previous book, "Outline of Clinical Psychoanalysis" (1934), because it includes six chapters of "Preliminary Considerations."

In the introduction, the dynamic, economic and structural points of view are given, and in a careful way the "Mental Development," as psychoanalysis sees it, is outlined. The "Archaic Ego" is taken as a starting point for detailed exposition of the instinct theory, culminating in a description of the "Passing of the Oedipus Situation" and the "Development of the Super-Ego." These six chapters are a lucid exposé of Freudian instinct theory and form a valuable object of study for students and teachers of psychoanalysis.

After clarification of the basic genetic and dynamic conceptions, Fenichel proceeds to outline the psychoanalytic theory of neurosis as the main part of his book. He described the neurotic conflict, summarizing it as follows: "In the neurotic conflict (between the ego and the id) an instinctual drive seeks discharge in a struggle against an opposing anxiety (guilt feeling, disgust, shame). The drive tends toward the world; the counterforces tend toward withdrawal from the world. The drive seems to be governed by its hunger for objects; the counterforces seem to be governed by a striving to avoid objects." The chapters on clinical psychopathology deal with the symptom neuroses, the perversions and psychoses, and with the character disorders. Every chapter is almost the outline of a book in itself. For instance, the chapter on "Depression and Mania" leads the reader from the early papers of Abraham to Freud's "Mourning and Melancholia" up to the present time, discussing the contributions of Rado and later collaborators. Fenichel reviews and develops the course of analytic understanding from the beginning and through the years to the present. He presents the whole problem with its solved and unsolved parts, pointing the possibility to further research. He succeeds in unifying his material and in fitting it in its proper place in the realm of psychoanalysis. Only limited space is given to the short outline of psychoanalysis as a treatment.

Otto Fenichel's book is not easy to read; it is couched in highly conceptional terms and a reader who is not constantly aware of keeping his analytic experience at hand may be in danger of losing the connection between theory and facts. One of the great advantages of this book is the exhaustive coverage of analytic literature. Every statement, almost every sentence, is carefully documented by references to its sources. Fenichel mentions, quotes and discusses 1,646 analytic publications in his text. Every time he succeeds in integrating the material to form a living unit. The bibliography,

at the end of the book, covers 70 pages. It alone is of great value for the teacher and student of analysis.

Otto Fenchel's last work is his most outstanding contribution to the teaching of psychoanalysis. As such, the book will remain as a lasting document to him, and will live for a long time to come.

MARTIN GROTJAHN

Modern Attitudes in Psychiatry: The March of Medicine, 1945. Edited by Iago Galdston et al. New York, Columbia University Press, 1946, 154 pp. \$2.00.

After a spate of condescending and frequently un-sound books on psychiatry for the general public, it is a pleasure to encounter this symposium of six authoritative, scholarly, yet readable articles dealing with psychiatry in its relation to medicine.

It is the tenth volume of New York Academy of Medicine lectures to the laity, and is not just another popularization of psychiatry; three of its contributors, in fact, are not psychiatrists. "World War I established psychiatry on a firm scientific basis and World War II is seeing its final integration into general medicine," writes Dr. Edward Weiss. This book advances and champions that integration.

Dr. Weiss has written the psychosomatic medicine paper; it is a gem of clarity and elucidation. Dr. Alexander, in a chapter on present trends and the future outlook, relates how psychoanalysis has enriched general medicine and paved the way for preventive (social) psychiatry. General Menninger provides an example of social psychiatry at work in his interesting account of the seven ways psychiatrists function in the army. Dr. G. Canby Robinson reviews the social aspects of illness; Dr. James H. Wall, the development of modern psychiatry; and Dr. Iago Galdston, the history of psychiatric thought.

There is not a dull page in the book. It is highly recommended to the interested public (including physicians), which, as Dr. Galdston writes, has transformed psychiatry, the Cinderella of Medicine, into its "pin-up girl."

LOUIS PAUL

HOFFMAN, FREDERICK J.: *Freudianism and the Literary Mind*. Baton Rouge, Louisiana State University Press, 1945, 354 pp. \$4.00.

This book represents the best application to date of the true historic method of research into the effect of Freud on certain authors. It was very easy for "critics" in the daily and literary press to say casually that Joyce and Kafka and Sherwood Anderson were "influenced by Freud." But Dr. Hoffman painstakingly studied his Freud, read the authors, interrogated them and their friends, and in this book shows what Freud and psychoanalysis meant to them and how they came to know of it. The results are very interesting in many ways. Generally speaking, most authors knew Freud from *The Interpretation of Dreams* and the *Three Contributions to the Theory of Sexuality*. Some knew *Civiliza-*

tion and Its Discontents; Thomas Mann states that his *Joseph* concept owed much to *Totem and Taboo* and to *Moses and Monotheism*. Often, however, the author had only a very indirect contact with Freud, perhaps through a friend who was being psychoanalyzed.

The scholarship of this book shows what was what. Very little is left to inference. Except in one or two cases, the influence was never very profound. Joyce's omnivorous intellect played with some of its concepts. Though his style in *Finnegan's Wake* is doubtless much influenced by his understanding of dream psychology, this reviewer thinks that a truer clue to his use of words is to be found in the last section of Freud's paper, *The Unconscious*; in fact, Joyce's critics seem to have rediscovered that particular train of Freud's thought without realizing it (see Edmund Wilson). The striking thing about most of the authors who came to know of Freud is the resistance they developed. Usually they proclaimed that the concept of resistance was purely a swindle: they had "no resistance," meaning that they didn't mind thinking about sex.

However, it was the concept of resistance and the correlated technical problems of defense that the authors studied failed to appreciate. They were deficient in an understanding of the ego's rôle in psychoanalysis, or in life when it serves to ward off the claims of instinct. For the most part, these authors meant by psychoanalysis not the true and complete set of concepts but a schematic picture based usually on Freud's two books.

Among the best chapters are those on Thomas Mann and Kafka; the one on Sherwood Anderson will dispel many mistaken views. The influence of Kierkegaard on Kafka explains a great deal more than anything he may have picked up from Freud. Other authors considered by Dr. Hoffman are D. H. Lawrence, Waldo Frank, Conrad Aiken, Ludwig Lewisohn, Henry Miller, and Dylan Thomas.

The only two entirely trivial errors this reviewer noted were the use of the term "anxiety neurosis" for "anxiety attacks" or "anxiety states"; and a reference to Jung's Clinic in Zurich, by which of course Bleuler's Burgholzli was intended.

BERTRAM D. LEWIN

BALDWIN, ALFRED L., KALHORN, JOAN, AND BREESE, FAY HUFFMAN: *Patterns of Parent Behavior*. North-Western University, American Psychological Association, Inc., 1945, 75 pp.

This interesting monograph definitely fills a gap in an area which has, unfortunately, received rather scant attention, although it of necessity concerns every individual who is attempting to carry on a clinical service to parents and children alike.

This study is concerned with the objective, statistical analysis of parental behavior. It presents a summary of the factual evidence relative to parental attitudes and, in some measure, at least provides an objective basis on which these attitudes can be appraised. It posits

a basis for the establishment of criteria for estimating parental attitudes.

As the authors state, the purpose of the study is "to discover the attitudes which underlie some common patterns of parent behavior; to relate these attitudes to other aspects of the home, such as parent personality, cultural status, the education of the parents, and their intelligence. Finally, we hope to show the relationship between these parental attitudes and the developing personality of the child." These measured attitudes are based upon the analyses of 125 cases rated during a six months' period in which the raters were thoroughly familiar with the scales, the children and the parents.

In the analysis of the parent, it was found that certain variables tended to cluster together. These were labeled by the authors, following the definition established by Sanford and his co-workers, "Syndrome Analysis." Three fundamental syndromes are indicated. These are: democracy in the home, acceptance of child and indulgence. These syndromes are further subdivided into the following categories, namely: the indulgent, the mixed indulgent and nonchalant attitude, and the nonchalant attitude in the pure form. This is somewhat further complicated by another group of social facets which are described as the democratic, the mixed autocratic-democratic point of view and the pure autocratic. Using these as types of symptom pictures, the authors attempt to indicate statistically the manner in which parental attitudes are distributed and correlated with the child's behavior.

It is, perhaps, unfortunate that the authors sought to develop so many categories at one time for the simple reason that it has made their study unduly complicated. Had they proceeded to present the picture in a more simplified manner first and then, perhaps, extended the study to the necessarily more complex pictures of parental-child relationship, it might have assisted the reader a great deal in recognizing the significance of the findings. Many of the observations are more or less obvious and, perhaps, could have been eliminated. In spite of these handicaps, the study is extremely interesting and represents the type of investigation that ought to be carried on with greater frequency and more intensively if we are to properly appraise the child with reference to the environment in which the child must seek to grow. If it does nothing more, this study will encourage further consideration by research workers in the psychology of child-parent interrelationship to study the effect of the parent as an environmental factor influencing the child and his personality.

MORTON A. SEIDENFELD

CUNNINGHAM, BESS V.: *Psychology for Nurses; Designed and Written for Student Nurses*. New York, Appleton-Century, 1946, 356 pp. \$3.00.

Now and then a text book appears which represents a milestone in the educational viewpoint within the field concerned. Those who have been responsible for the training of nurses will recognize Professor Cunningham's text, *Psychology for Nurses*, as such a

contribution. The scope and content of the nurse's curriculum has grown steadily as the emphasis upon professional standards has increased. Cunningham has met these demands by producing a text that is much more comprehensive than has been true in the past.

In addition to being up-to-date, this book places emphasis upon the rôle psychology plays in the patient's illness and in the nurse's care of the sick.

Many references and suggested readings are included. It is to be hoped that nurses' training institutions will be able to supply this background and that the nurse herself will make use of these—but if she doesn't, or can't, at least the text itself will supply the answers to most basic psychological problems she is likely to encounter on the wards.

The suggested activities which the student may perform are well chosen, and directed toward stimulating thought, culminating in an application of psychological principles to daily problems.

This book will be useful in the general psychology course for nurses and will provide assistance to the nurse in her psychiatric training as well. It compares favorably with the better introductory texts in psychology.

MORTON A. SEIDENFELD

HERZBERG, ALEXANDER: *Active Psychotherapy*. New York, Grune and Stratton, 1945, 152 pp.

Alexander Herzberg represents a certain group of German psychotherapists who benefited from the extreme antagonism of the European medical profession towards psychoanalysis and the great need of neurotic patients for some kind of psychiatric help. With great skill, often with great intelligence and intuition, this group of therapists offered their own individualistic and frequently original psychotherapy which they carefully set aside from psychoanalysis. In the American scene, where easier acceptance of new ideas gives a better chance for analytic thinking, the contrast to analysis is less underlined. So, while introducing his personal "active" style of psychotherapy, Alexander Herzberg states that his method is "a compound, or rather an integration, of psychoanalysis, persuasion, exertion of direct influence on the patient's milieu, and tasks given to the patient. The dominant measure in this integration are the tasks; the functions of the other three factors are mainly, though not wholly, preparatory and accessory ones."

In 33 chapters many examples of this kind of "active psychotherapy" are given. The part of psychoanalysis seems to be small, the part of guidance including threat and strictness seems to be great. The cases treated are diagnosed as different forms of neurosis, depressions and perversions.

In his introduction, Herzberg states that since his ideas "cannot be classified as either Freudian, Adlerian or Jungian, they will be rejected by the followers of these great schools of thought." This quite naturally is not the reason why Herzberg's methods will not be accepted by scientists. It is his superficiality as

betrayed in every case history, his lack of true understanding of his patients, and, last but not least, the naivety of his therapeutic approach which makes his "method" unacceptable. The most amazing example can be found on page 97: "... a small boy is allowed to ride on his nurse's back, which excites him sexually and leads to a sadistic perversion." Another example from page 50: the patient "is given the tasks of avoiding beer and sexual topics in conversation, with a view to lowering the intensity of her sexual impulses."

MARTIN GROTJAHN

STEINER, LEE R.: *Where Do People Take Their Troubles?* Boston, Houghton Mifflin Company, 1945, 265 pp. \$3.00.

Most people want to tell their troubles to someone, and to hear advice and counsel which fits in with their own preconceived ideas. All of us have at times wanted to find someone who would tell us what is going to happen, what we should do, or would take the responsibility for making a decision. It is perhaps a bit unfortunate that physicians, psychologists, and others who are properly qualified to assist John Q. Public in solving his problem seem frequently to lack the capacity to appeal to him. As a result, charlatans and frauds thrive on the lunatic fringe of psychology, psychiatry and religion. It is this fringe that has attracted Lee Steiner into investigating and presenting in *Where Do People Take Their Troubles*.

This book will prove of especial interest to both psychiatrists and psychologists, although there is no doubt that the public as a whole will find it fascinating. Its values are chiefly to be found in the rather detailed and careful exposure of some of the principal psychological quackeries, and, by implication at least in some criticism of the failure on the part of the legitimate psychological professions to serve those that need help. And if you doubt that people do want psychological help, a perusal of Steiner's opus will convince even the most skeptical.

Steiner deals at length with her investigations of those who find it profitable to carry on their activities as pseudo-psychologists under such high-sounding titles as "Hypnologists," "Counsellor in human relations," or in such institutions as "The College of Divine Metaphysics" and "The College of Universal Truth." While such exposés have been made before, this author seems to have gathered more objective data and indicated quite clearly how such people can "get away with it."

Even the columnists who deal with personality problems, home adjustment and marital dysfunction on the basis of letters sent to them by the psychically ailing are treated within the covers of this interesting book. So, too, the radio exponents of the art and science of psychology—the ever-vocal "Voices" and "Courts" are exposed for the shallow hoaxes they are.

In a similar fashion, Steiner lays open for the inspection of the reader the advertising "Vocational Guidance Experts," "Lonely Heart Societies," the theological quackeries, the spiritualistic-minded; in short, most

typical examples of this sort of appeal to the gullible are presented to those who want to learn the facts.

Every individual who works in the field of mental hygiene must read this book. If it does nothing more, it will stimulate the thinking reader to seek for a type of mental hygiene program that will serve the larger mass of the middle class whose daily life is often filled with complex or simple, but always harassing, mental problems that destroy their feelings of security and self-confidence. This is the only way to eliminate the psychological fakir.

MORTON A. SEIDENFELD

DUMAS, ALEXANDER, AND KEEN, GRACE: *A Psychiatric Primer for the Veteran's Family and Friends*. Minneapolis, University of Minnesota Press, 1945, 214 pp. \$2.00.

Hardly a month goes by without one or more books appearing that deal with veterans' problems of one sort or another. This is a natural outcome of the interest of society in general in the problems of major interest to such a large and important segment of those who make up that society. The actual contribution of such writings to the solution of any of these problems is, unfortunately, all too inadequate.

The content of the *Psychiatric Primer* is, therefore, not new. It has already been presented in more than one book published in the past year. But that shouldn't affect its appeal at all, for in the midst of many similar books it will stand out for its simplicity, directness, style, and clarity. It is a good book specifically designed for the audience indicated in its title. That audience will like it and profit from its reading.

In clear, matter-of-fact language, Dumas and Keen tell the veteran, his family and his friends what experiences they may anticipate sharing. The problems of getting back to normal civilian responsibilities, the absence of battle discipline with the substitution of the socio-economic problems of a rather insecure and puzzled peacetime world are accurately outlined.

Adequate attention to the problem of the "normal" ex-serviceman, his adjustment to wife, children, his folks and hers, and even the unmarried are not overlooked. Re-employment and re-orientation in regard to vocation and vocational training are discussed intelligently with the inclusion of many helpful suggestions.

Extremely helpful are the discussions of the problems found in the chapters on the wounded and physically handicapped veteran. The importance of psychological as well as physical rehabilitation is stressed in a most admirable fashion. The psychosomatic aspect that is so frequently overlooked in discussions of the wounded receives at the hands of these authors proper consideration.

The importance of proper job selection in those with physical limitations is indicated. The chapter dealing with "If He Is Physically Hurt . . . He Can Live Again" is so packed with solid ideas on rehabilitation that it should be read by everyone who works with the physically limited. There is nothing maudlin in this

solution, it is sane and workable, the end product of its application should be capable of taking his place in society and of overcoming his limitations. Parents, friends and employers are supplied with "Do's and Don'ts" that should be read and re-read.

The chapters on the mentally ill veteran are singularly illuminating. They point out the necessity for lifting the veil of mystery from mental illness. The lucid explanation of the "N-P" and his problems will be helpful to the veteran and those who will be in close contact with him.

Every veterans' hospital should make this book available to its patients. It will save many explanations. The parent, the wife and the employer should read the chapters so that they may convert their worries into useful cooperation and intelligent planning. Fears may thus be replaced with a knowledge of mental pathology expressed in simple words. All in all, *A Psychiatric Primer* is the clearest exposition that this reviewer has encountered.

MORTON A. SEIDENFELD

CURRAN, CHARLES A.: *Personality Factors in Counseling*. New York, Grune and Stratton, 1945, 310 pp. \$4.00.

Those who are unfamiliar with the scope and effectiveness of the undirected interview as a psychotherapeutic technique will find Curran's "Personality Factors in Counseling" extremely revealing. Those who are interested in this procedure will find the book stimulating and a significant contribution to the research literature on non-directive psychotherapy. Even those who strongly favor the directed interview can find useful suggestions that are adaptable to their viewpoint.

Not all professional readers will agree with Curran on the objectivity of non-directive therapy. However, those who read it with an open mind will at least recognize the value of the procedure as one mode of effective attack in the solution of personality problems.

Throughout the presentation and analysis of the sample interviews one is given a clear picture of what is happening, not only from the client's standpoint but from that of the counselor as well. The use of a running commentary interspersed in the body of the recorded interview segments materially assists the author in making his point. The emphasis in the major portion of the book is placed upon the results of the author's research on the measurement of the subjects' attitudes toward non-directive counseling. These were analyzed by three methods: (1) the interview content analysis; (2) the problem-solving analysis; (3) the insight evaluation chart.

The detailed analyses are dynamic in showing the changes in the mental behavior of the client through his 20 interviews. Unfortunately the presentation does become cumbersome in spots but it is well worth reading, and re-reading, because of the emphasis it gives to the change in emotional orientation and the growth of effective insight.

The last portion of this study discusses the implications contained within it and related investigations as

they apply to a philosophy of personality. Here Curran attempts to show how indirect guidance proves itself valuable in overcoming maladjustment and in providing a therapeutic medium capable of providing relief of conflict situations. The significance of release, insight function and choice function in relation to the maintenance of adjustment are discussed as fundamental elements of personality.

MORTON A. SEIDENFELD

BOCHNER, RUTH, AND HALPERN, FLORENCE: *The Clinical Application of the Rorschach Test*. New York, Grune and Stratton, 1945, 331 pp. \$5.00.

This is a revised and enlarged version of the 1942 edition issued under the same name. It divides naturally into two sections. The first is devoted to the technical aspects of administration and scoring with a discussion of the interpretation of the elements important in Rorschach testing. The second deals with the analysis of records representing the major clinical entities with a number of normal protocols included for comparative purposes.

The value of the book will vary according to the use the reader means to make of it. The section devoted to technique and interpretation is clear, economically written and well organized, although the authors encounter the difficulties inherent in discussing piecemeal material which must be seen as a dynamic whole. The records selected for demonstration are rich and challenging, so rich that one is all the more conscious of the fact that the analyses offered are often meagre and somewhat static. Moreover, the quest for typical patterns associated with the clinical entities leads to an oversimplification of the problem of differential diagnosis with the Rorschach. Thus, to the newcomer in the field, the book may seem to promise too much too soon. If its limitations are kept in mind, it will prove valuable to students interested in a general grounding in Rorschach testing and who wish to postpone complex theoretical questions until they have mastered the fundamentals of the technique.

VERNON CLARK

REIK, THEODOR: *The Unknown Murderer*. New York, Prentice-Hall, Inc., 1945. 260 pp. \$3.00.

This book should have a particularly wide popular appeal after the recent newspaper accounts of the unjust conviction of a man for a crime that was subsequently confessed by another. Dr. Reik has collected a surprising number of documented cases illustrating the miscarriage of justice in murder trials. He uses these as the basis for a clear and easily readable discussion of the commonest psychological factors leading to such mistakes.

He points out that "If everyone who had a motive committed murder there would be few cases of natural death," and that primitive tribes exhibit an interesting projection of this in that they do not believe in natural death, but believe in "sorcery as the sole cause of death." But today, "a murder without a murderer, a deed with-

out a trace—these seem to revive an old belief which once lived in all of us, namely the belief in the possibility of murder by thought." Thus an unsolved murder leaves everyone with a feeling of guilt, and "what they fear especially is the contagion of the taboo. Freud has discovered in this fear the unconscious fear of temptation common to every member of the tribe."

He points out that clues are vestiges of primitive magic and often are the expressions of unconscious attempts on the part of the murderer to assuage his own sense of guilt. The "visiting card" he interprets as a part of the murderer's person left behind to conciliate the avenging spirit of the victim. The return to the scene of the crime he interprets as a kind of repetition-compulsion, without so naming it, referring, rather, to "an unconscious intention, alien to the ego, of mastering the deed psychologically."

Many judicial errors seem to be the result of the compulsion under which the judge and jury labor not to leave an unsolved riddle, and to their tendency to intuitively understand the unconscious processes of the accused and to suppose that the accused's sense of guilt is proof of actual guilt.

He makes a strong plea against the use of psychoanalysis to establish the guilt of innocence of any case, but makes an equally strong plea for its use in criminological research: "If we all unconsciously harbor such evil wishes, if their domain is so extensive that judges sometimes arrive at false conclusions on the strength of them, is there really a world of difference between the wish and the deed? Is punishment really the proper reaction to a breaking through of the boundary-line between the two? Must not deeper research lead us to question this attitude?"

B. R. MERRILL

ROHEIM, GEZA: *The Eternal Ones of the Dream*. New York, International University Press, 1945, 332 pp. \$4.50.

This is another analytically oriented anthropological study, the data being based both on Roheim's personal observations and on reports of other students in the field. Unfortunately, some of these other observers seem to have been untrained psychiatrically or analytically so that the validity of interpretations based on their observations must be brought into question. The study of this primitive Australian culture throws light on the significance of circumcision (castration, an attempt to intimidate the "young bucks" of a tribe), on totemism, and on other ceremonies and traditions. Totemism is interpreted as a defense against separation anxiety. It aids man "in his struggle with internal and external difficulties (as) a balancing apparatus consisting of a series of introjections and projections."

Various ceremonies symbolize the rejuvenation of the weak, aged and decrepit. The several human frustrations are dealt with in this primitive culture through mechanisms comparable to those employed in more sophisticated civilizations: reaction formation, identification, etc.

Many myths are studied. It seems that the interpretations offered by Roheim are open to the same criticism as would be the interpretation of a dream or fantasy without adequate associative material. The implications of these myths, as offered, may be correct and seem probable but they are certainly far from proved, in contrast to the validity of those myths which obtain corroboration from other sources. In spite of their remoteness in time, it appears that there is more corroboration for the interpretations of Greek and Roman mythology than for much that is offered by Roheim.

JOSEPH LANDER

BOOK NOTES

LIEBMAN, JOSHUA LOTH: *Peace of Mind*. New York, Simon and Schuster, 1946, 203 pp. \$2.50.

The thought has occurred to some that the psychiatry of the future will be preached from the pulpit. Nowadays ministers exhort people to be good, but do not tell how this can be done. When they begin to present workable *methods* acquired from dynamic psychology, the need for psychiatrists may diminish.

Rabbi Liebman of Boston has assimilated some psychoanalytic insights on love, hate, fear, conscience, and grief into a liberal religious creed, but it is problematical whether reading his humane words will bring "peace of mind," although readers may acquire a limited but useful understanding of their evaluational problems.

Dr. Liebman is probably better in the pulpit where he can exert his influence week after week and where his adjectival prose is more apposite. The present work is a courageous and commendable effort in bringing sound dynamic psychiatric knowledge into the church.

LOUIS PAUL

STIEGLITZ, EDWARD J.: *A Future for Preventive Medicine*. New York, Commonwealth Fund, 1945, 93 pp. \$1.00.

Dr. Stieglitz avers that the future of preventive medicine depends on 1) the broadness of the concept of prevention, and 2) a growing understanding of the multiple factors in disease causation. Under one is offered the notion of constructing health, i.e., maximizing individual efficiency and well-being by periodic health inventories, extension of industrial medicine and health education, and other means. Under two is discussed the great need for studies of fifth column (degenerative) diseases.

It is to be noted that organismal unity and multi-causality, basic tenets of psychosomatic medicine, have been assimilated into his field by Dr. Stieglitz.

The author comments on the problems of mental disorders, making this noteworthy statement: "The accomplishments of military psychiatry should be credited to a major degree with the success of our youthful armed forces."

This monograph is one in the series sponsored by the New York Academy of Medicine Committee on Medicine and the Changing Order.

LOUIS PAUL

BEAUMONT, HENRY: *The Psychology of Personnel*. New York, Longmans, Green and Company, 1945, 309 pp. \$2.75.

Dr. Beaumont has covered the subject of the psychology of personnel in a very complete and factual manner. The sequence of presentation of the material is a natural one, starting with the needs of the employee as an individual and a recognition of his differences from other employees. Management then enters the picture through a discussion of the various aspects of job analysis, selection of employees, training and supervision, and the establishing of adequate working conditions. This is followed by a discussion of the workers' health and the elements included in promoting safety with a common sense approach to the psychological as well as the physiological aspects. The last two sections are concerned with providing incentives and occupational adjustment and indicate ways in which the basic needs mentioned in the first section can be met with a gain for both management and labor.

This book is one of the best "textbooks" or handbooks available on this subject. It should reach the hands of all persons interested in the up-to-date functioning of modern industry. Large industries can well use it as a source of evaluating their present status and small industries will find component sections which can be adapted to their own specific problems. It is not a book to be skimmed but rather one to be thoroughly digested and given serious thought.

F. W. DOW

CANER, G. COLKET: *It's How You Take It*. New York, Coward-McCann, Inc., 1946, 160 pp. \$2.00.

A practicing neuropsychiatrist, Dr. Caner, of Boston, has written a mental hygiene book for late teen-agers. In question and answer form he considers attitudes toward work, competition and those in authority, feelings of inferiority and superiority, physiologic effects of emotion, and how personality traits are developed and modified. Dr. Caner offers a great deal of good advice, but in such a dull, lifeless, non-dynamic, and abstract way that its effectiveness is questionable.

Dr. Caner stresses the inferiority complex in connection with the difficulties of adjustment, and advises "autosuggestion," visualization of proper responses and encouragement of team-feeling in order to develop more mature attitudes and emotional stability.

LOUIS PAUL

BOOKS RECEIVED

BERGLER, EDMUND: *Unhappy Marriage and Divorce*. New York, International Universities Press, 1946, 167 pp. \$2.50.

BRODY, SAMUEL: *Bioenergetics and Growth*. New York, Reinhold Publishing Corporation, 1945, 1023 pp. \$8.50.

DAVIS, JOHN EISELE: *Rehabilitation, Its Principles and Practice*. New York, A. S. Barnes and Company, 1946, 264 pp. \$3.00.

HERZ, ERNST, AND PUTNAM, TRACY J.: *Motor Disorders in Nervous Diseases*. New York, King's Crown Press, 1946, 184 pp. \$3.00.

HUME, EDWARD H.: *Doctors East, Doctors West*. New York, W. W. Norton and Company, Inc., 1946, 278 pp. \$3.00.

KALINOWSKY, L. B., AND HOCH, P. H.: *Shock Treatments and Other Somatic Procedures in Psychiatry*. New York, Grune and Statton, 1946, 320 pp. \$4.50.

MASSERMAN, JULES H.: *Principles of Dynamic Psychiatry*. Philadelphia, W. B. Saunders Company, 1946, 322 pp. \$4.00.

MORGAN, JOHN J. B.: *How to Keep a Sound Mind*. New York, Macmillan Company, 1946, 404 pp. \$2.75.

NIELSEN, J. M.: *Agnosia, Apraxia, Aphasia*. Second edition. New York, Paul B. Hoeber, Inc., 1946, 292 pp. \$5.00.

Proceedings of the National Conference of Social Work; Selected Papers 72nd Annual Meeting, 1945. New York, Columbia University Press, 1945, 417 pp. \$5.00.

SADLER, WILLIAM S.: *Modern Psychiatry*. St. Louis, C. V. Mosby Company, 1945. \$10.00.

VON NEUMANN, J.: *Theory of Games and Economic Behavior*. Princeton, Princeton University Press, 1945, 625 pp. \$10.00.

STUDIES ON THE NATURE OF CERTAIN SYMPTOMS ASSOCIATED WITH CARDIOVASCULAR DISORDERS*

GEORGE A. WOLF, JR., M.D.,** AND HAROLD G. WOLFF, M.D.**

METHOD

Two groups of individuals who cannot meet the demands of their life situations may develop symptoms of circulatory disorder. The one has symptoms resulting primarily from structural disease of the heart and circulatory failure. The other and larger group includes those patients who have symptoms of circulatory disorder primarily for other reasons, regardless of whether they do or do not have structural heart disease. The purpose of this study is the analysis of the symptoms referable to the cardiovascular and respiratory systems occurring in patients with and without heart disease but not caused by valvular or myocardial damage or congestive heart failure.

The undamaged heart has a capacity to meet the demands of strenuous efforts far beyond those of the usual daily activities. The ability to tolerate strenuous effort cannot be interpreted solely as an expression of myocardial effectiveness but rather as a manifestation of the total circulatory function, which in turn is intimately related to the life situation of the individual, his attitudes toward the latter and his feelings.

The following study has been focused upon the reactions of a small group of individuals to a variety of life situations, with special reference to cardiovascular and respiratory functions. Emphasis was placed upon the reactions to persistent low-grade stresses and strains which are a part of "every day" living and which constitute the core of the bedside problem, rather than upon the well-known responses to major life crises. It has been possible by a day to day study over a period of almost a year to obtain such data. Attempts were made to ascertain to what extent efficiency of the cardiovascular and respiratory systems was impaired during certain life situations, what the identifiable emotional responses were and how these various reactions bear upon symptoms and disease.

*The work described in this paper was done under a contract, recommended by the Committee on Medical Research between the Office of Scientific Research and Development and Cornell University.

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This paper was delivered at the Conference of the Committee on Cardiovascular Disorders of the American Society for Research in Psychosomatic Problems, December 1945. This conference was aided by a grant from the Mary and Albert Lasker Foundation.

Cardiac Output: A ballistocardiograph was constructed (53). The design incorporated features from the instrument used by Nickerson and Curtis (47) and Meneely (44). Essentially it represented a high frequency and moderately but not critically damped bed. Calibrations were made before each experiment, and calculations employed the wave area formula of Starr (53). Cournand *et al.* (16) have shown that ballistocardiographic values are generally lower by a constant amount than results of determinations by the Fick principle. To avoid the controversial issue concerning absolute output (58), the results in these experiments are expressed in percentage change over the daily resting level. The cardiac output measurements are in accord with the figures obtained by Starr (53). Nickerson and Curtis (47) have indicated that values obtained on the ballistocardiograph vary according to the manner in which the record is taken. In these experiments attention was focused upon the change following exercise each day rather than on the daily resting levels. This method causes no discomfort or pain since it avoids such procedures as arterial puncture or auricular catheterization.

Respiration: Recordings were made with a Benedict Roth type of spirometer equipped with a fan to improve gas circulation. The reservoir was filled with oxygen and the contents of the bell were tested frequently for the presence of carbon dioxide. The soda lime container was changed after thirty-five experiments. Measurements of oxygen consumption, minute ventilation, tidal volume, vital capacity, mid-position of the chest, and utilization coefficient were made.

GENERAL PLAN OF THE EXPERIMENTS

Two healthy, trained observers were studied over a ten months' period at approximately the same time each day. The subjects were observed in the middle of their working day, two hours after the ingestion of food. It was desired to observe their responses to the experimental situation under those circumstances which most closely approximated every day life situations. They were therefore not under basal conditions. The subject rested five minutes on the ballistocardiograph bed and, sub-

sequently, resting determinations of the pulse, blood pressure, ballistocardiogram, including calibration deflection, and a two-minute record of respiration were made. The subject then got up from the bed and ascended and descended two 9 inch steps a fixed number of times during a minute and a half. The number of ascents and descents was ten more than the number indicated by Master and Oppenheimer (41) for the given sex, age and weight. This amount of work in these two subjects resulted in a blood pressure rise which usually returned to the resting level after two minutes. Immediately after exercise the subject returned to the ballistocardiograph bed, and thirty seconds after exercise a ballistocardiogram was taken. At one, two and three minutes, pulse and blood pressure were recorded. At three minutes another ballistocardiogram was taken, and immediately thereafter a six minute spirometer tracing was made. Vital capacity was obtained during the last minute of this period. Ten minutes after the cessation of exercise the final ballistocardiogram, pulse and blood pressure were recorded. The day's events up to the moment were then discussed with the subject as follows: The recent use of stimulants, such as coffee, alcohol and tobacco, the length and character of the previous night's sleep, the use of medications, and the nature of physical exertion since the previous day were noted. The subject then attempted to estimate his relative energy, effectiveness and spirits. The events of the previous day and evening, the activities of the morning and the prospects for the remainder of the day were discussed. The mood, preoccupations, dreams, and behavior were described. Events bearing upon the dominant affect were noted. The operator's description of the subject was also recorded. Thus the usual methods of psychological investigation were utilized, including catamnestic and biographic data, free association, dream analysis, and description of behavior. The clinical details of minor illnesses occurring in the course of the experiment were noted. Thus a relatively precise and detailed picture of the individual in his environment and his reactions were recorded.

Also, a series of experiments were made on selected patients who, exhibiting the symptoms under consideration, were less systematically investigated. Observations of the pulse, blood pressure, ballistocardiogram, and respiration were made following exercise in the manner described in the first series, except that recordings were not made daily. Also, observations were made during interviews focused upon important life experiences. The exact procedures will be considered when the results are described.

DESCRIPTION OF SUBJECT 1

The subject was a 46-year-old physician, married, and the father of a 4-year-old child. He was a member of the university faculty and divided his energies among teaching, care of patients and investigation. He was of a linear body type, quick moving, restless, active, and moderately athletic. His health was excellent; he had had only minor illnesses and was intolerant of shortcomings in his energy. There had been no cardiovascular symptoms, and with the exception of rare headaches there were no bodily complaints. He was talkative, enjoyed badinage and humor, and smiled and laughed a good deal. He worked hard and drove himself toward his goals. His interests were narrow although his curiosity was readily aroused in a superficial way on many topics. His daily program was ordered. The subject was relatively inelastic and dealt brusquely with opposition. He resented being "pushed," and when so pressed he became irascible, aggressive and hostile. He arbitrarily rejected institutional or personal efforts to modify his arrangements.

His security was derived from two sources: (1) the affection and esteem of his wife and child, the stability of his home life and the emotional support afforded by those associated with him in his family and work; (2) the fulfillment of his aspirations in his work. He was dedicated to his work and was focused upon creative effort both in himself and in others. He was indifferent about popularity and scorned those who pursued it. He was extremely critical. Contempt was readily aroused by unwitting or deliberate pretense, deceit or self interest, especially when they involved esthetic or creative issues.

He was economically secure and had little interest in further possessions. He was extremely sensitive to assaults which threatened his values or indicated lack of backing or support by those associated with him. As regards these basic values, there was no division between those associated with him as fellow workers or as friends or family. When through pressure of circumstances or through blunt assault by those about him, his creative and esthetic values were threatened, vigorous conflict ensued. Often he was able to identify the elements in the conflict. These were associated with periods of mounting resentment and tension which ultimately ended in feelings of frustration, discouragement, dejection, feelings of not being supported, and sometimes frank though short-lived depression. Also, being pressed into patterns other than his usual—new places, travel, crowds, unfamiliar, unsympathetic

persons, committee meetings, boring situations—was associated with tension states and poor sleep. In brief, interference with the pursuit of his aims was followed by a mood colored by resentment, disdain and anger, with tension as the conspicuous feature.

DESCRIPTION OF SUBJECT 2

The subject was a 42-year-old unmarried woman who had worked for twenty-one years as an investigator. She was an enthusiastic, warm-hearted person. She was insecure and frustrated in that she put a value on approval which she could seldom win because of the fear of being hurt by criticism. She had done well in school, always standing at the top of her classes, but her subsequent performance in life had fallen short of standards set for her. She liked to work hard and had a better than average amount of energy. She was easily stirred to resentment and sometimes anger, but such emotional states were short-lived. She occasionally had short periods of depression. These were characterized by feelings of guilt and worthlessness and usually precipitated by situations which she considered unjust and which she felt were incapable of resolution. During such periods she became irritable, lost sleep and became fatigued easily. Such episodes seldom lasted more than two or three days, and for the most part her mood was cheerful and her spirits high. She had three security props which were essential to her. These included conviction of health and energy, loyalty and approval of friends, and dedication to her work. Her personality was characterized by the fact that she had strong convictions about responsibility towards her work and equally strong feelings of loyalty towards her family and friends. She was tireless when her work was approved, but was deeply hurt and exhaustible when her efforts were not recognized or approved. She rejected any intimation of weakness in herself.

A. DYSPNEA DUE TO DISTURBANCE IN VENTILATORY FUNCTION

Increase in the tidal volume sufficiently great to cause a subject to become aware of the act of breathing may give rise to one important variety of dyspnea. Increase in tidal volume may be brought about by such means as diminished oxygen capacity of the blood (anemia), impairment in alveolar oxygen transport in the lungs, increased oxygen demand in the tissues, acidosis, and obstruction in the air passage. In the course of observations upon the respiratory function of patients and normal in-

dividuals it became evident that increase in the tidal volume and minute ventilation occurred in the setting of adverse life situations and associated emotional responses.

1. *Dyspnea and hyperventilation associated with sustained conflict, anxiety, humiliation, frustration, and anger.*

Subject 1, some months before the following observation, had been invited to address a large lay audience on the subject of his studies. As inducement he was sent a provisional program of speakers which included his name among a group of well-known and able workers. The subject was long undecided about giving the lecture but finally concluded that the effort would be worth making because of his interest in public health and because of the representative nature of the group. Subsequently, certain phases of his investigative work became confidential because it was being done under government contract. It was necessary to alter the content of the lecture, and the decision as to what could be told became a problem and served to make the lecture a source of conflict. The subject approached the lecture with the feeling that he had made a mistake in deciding to take part in the program. In spite of his misgivings he resolved his conflict in part by deciding that what he had to say was of importance to his audience and that because others on the program had sacrificed time and effort in participating, it was his duty to conform. On the day of November 14, 1944, and preceding the lecture, the subject experienced anxiety, urinary frequency, sweating, and cold hands. The pulse, blood pressure and cardiac output were elevated markedly after exercise. The respiratory response was most unusual in that the subject was obviously dyspneic for a longer period after the cessation of exercise than on other days. The ventilation rate was three times the usual levels after the same amount of exercise. This difference was not noted in the oxygen consumption. The subject proceeded to the auditorium. It soon became apparent that arrangements had been poorly made. The program was delayed an hour in starting, and the whole atmosphere was one of casualness and poor organization; speaking facilities were inadequate. The audience was unresponsive and essentially uninterested in the content of the symposium. The twenty-four hours after the speech were characterized by anger, resentment and the feeling that he had been duped into participating in a program which was on the whole a waste of time. He was humiliated, angry and frustrated. The day after the lecture his pulse rate, blood pressure and cardiac

output again failed to return to the resting levels by two minutes after exercise. The respiratory changes were much less marked. The second day after the lecture the subject regarded the incident with humor, and the functions returned to their usual state (fig. 1).

Comment: These experiments indicate that the efficiency of the organism as evidenced in cardiovascular function was impaired (*i.e.*, the work of the heart was increased) under circumstances of conflict which resulted in reactions of anger, frustration, humiliation, and anxiety. Respiratory in-

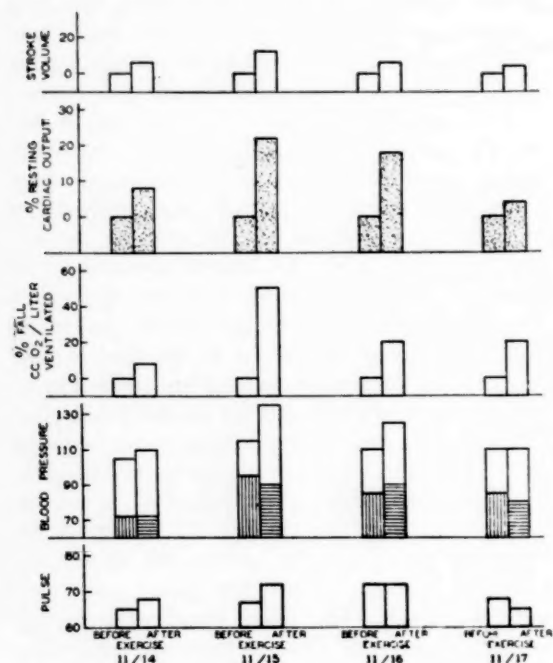


Fig. 1. Dyspnea and palpitation after exercise caused by hyperventilation and increased cardiac output in association with anxiety, frustration and anger. The per cent fall of cc. of oxygen per liter ventilated is equivalent to per cent increase in air ventilated per cc. of oxygen utilized.

efficiency was apparent (*i.e.*, oxygen utilization was diminished) and was shown to be dependent upon impairment of the ventilatory rather than the respiratory mechanism of respiration (17). Thomas (63) has shown that in patients with so-called soldier's heart, the oxygen utilization is impaired in a similar fashion.

2. Dyspnea and hyperventilation associated with the emotional response to an acute illness.

On October 18, 1944, following an upper respiratory infection, subject 2 complained of fullness in the right ear. That night she awoke from sleep with right otalgia and otorrhea. The otologist advised a myringotomy and admission to the hospital.

The situation then changed in that the subject became apprehensive about the operation. The factors in this apprehension were: 1) frankly expressed fear of the operation because of the possible serious complications of a myringotomy; 2) a preoccupation with the complications of otitis media; 3) her feeling of personal insecurity and humiliation in losing her usual good health ("I felt caught . . . that the situation was out of my hands"); 4) she wanted to remain at her job, fearing the unvoiced disapproval of her employer. Bed rest was maintained during a four-day period and sulfadiazine was given. Fever and leucocytosis were absent. As her physical state rapidly improved, her conflicts became more marked because she desired to return to work and yet could not obtain her

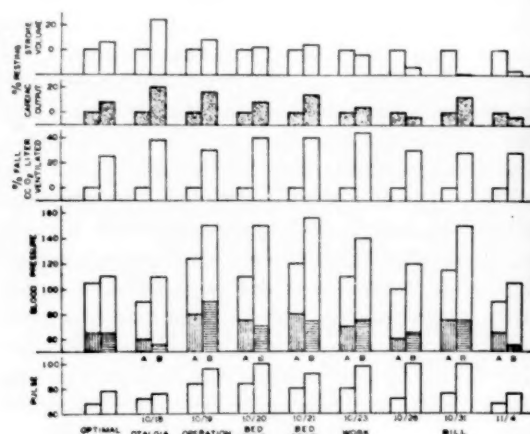


Fig. 2. Hyperventilation and circulatory responses to exercise during a period of acute illness and emotional stress.

physician's approval. His misgivings also created further doubt about the complications of her illness if she left the hospital. Just prior to her discharge from the hospital she wept for about an hour. She then returned to work and stopped her medication but remained apprehensive about her physical state. At the end of a week she had no complaints. Observations were made during this entire period and are illustrated in figure 2. Prior to the operation, during the period of hospitalization and after the subject returned to work, the cardiovascular responses were characterized by high levels of the pulse, blood pressure and cardiac output after exercise, in contrast to the responses on optimal days. The day after the operation the subject complained that the given amount of exercise "seemed to be more difficult" than usual, and respiratory tracings revealed a greater minute ventilation after exercise than was observed on optimal days (see fig. 3).

Oxygen consumption was not similarly affected. The cardiovascular and respiratory functions approached optimal levels during the week following the illness. On October 31 the subject received a statement of her hospitalization costs. Attention is called to the fact that the responses of the cardiorespiratory functions after exercise closely resembled those seen during the height of her illness.

Comment: The course of events described above is common during minor illness and represents, as in this subject, the effect of bacterial invasion plus reactions associated with fear, anxiety, frustration, and resentment. Thus, on October 18, when the effects of bacterial invasion (*i.e.*, prior to drainage of pus) were probably approaching their maximum for the illness, the cardiorespiratory derangements were not as striking as on October 21, when the effects of the invasion were becoming minimal.

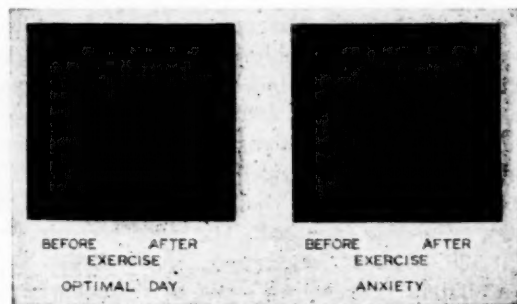


FIG. 3. Spiograms showing hyperventilation present four minutes after exercise associated with dyspnea on a day when anxiety was experienced prior to a minor operation.

However, as the improvement continued, her conflict became more and more intense, associated with clearly evident circulatory derangements and general debility. To support the concept that most of the defects were not dependent upon bacterial action, bed rest or chemotherapy stands the performance before and upon receiving the bill of costs for her hospitalization. Here, with recurring resentment, the circulatory and respiratory derangements closely resembled those seen in the middle of the illness.

The above-described cardiorespiratory changes may be relevant to the dyspnea commonly occurring in convalescence in addition to such symptoms as weakness, palpitation, easy fatigability, dizzy spells, and fainting (see section D). They may also have some bearing on the frequent occurrence of cardiovascular neuroses following minor illnesses.

3. Nocturnal dyspnea simulated by hyperventilation during periods of suppressed rage.

A 34-year-old woman, complaining of attacks of

nocturnal dyspnea, with essential hypertension without clinical evidence of irreversible vascular disease, was interviewed while lying on the ballistocardiograph bed. Records of respiration, pulse, blood pressure, and cardiac output were taken before, at intervals during and after the interview. The patient related and discussed those aspects of her life situation which were considered most relevant. She was told to talk freely and not hesitate to display her feelings. Her statements were recorded and chronologically related to the physiological observations. The interview itself represented a stress-producing situation. The resting observations before exercise the day before and just before the interview were identical. During the interview the patient was aware of and complained of feelings of isolation and loneliness because of her husband's absence. (He was in the Army and overseas.) She described working for a perfectionistic employer under work conditions which all recognized as difficult and which made "perfect work" impossible. Nevertheless, her employer, during his tension states, loudly disapproved of the patient's performance; and the latter, herself a perfectionist, was deeply hurt and enraged. During her married life and before her husband's departure she was able at the end of the working day to voice her anger and regain her personal dignity through her husband's sympathy and support. But after his departure and because of her stand-off, aloof manner, which precluded confidential discussion with friends, her suppressed anger turned to rage and her tension mounted. At the time of the interview she was aware only of tension but told about obsessive and morbid fears. The fear of poisoning from the gas jet of her refrigerator caused her to turn it off at night. More lately she had feared that she might hurt someone or herself. She also had murderous dreams.

Figure 4 shows the changes in cardiovascular and respiratory function which occurred during the interview with this patient. The blood pressure and cardiac output were seen to be significantly elevated during the interview, and they returned to resting levels after reassurance and a hopeful formulation. Respiratory tracings done before and after the interview demonstrated that as a result of the interview the minute ventilation doubled and the utilization coefficient halved, without significant alteration in the oxygen consumption. The minimum oxygen consumption attendant upon respiratory effort was not great enough to be detected by the method used. The effect of the interview on respiration was similar to the effect of exercise, although the patient had not moved from the bed (see fig. 5).

Comment: The effects on blood pressure, cardiac output and respiration were as great or greater and more prolonged during recall of disturbing life situations than following exercise, which was tolerated well, according to the standards of the Master Two Step Test (41). The patient complained of awakening at night with a sensation of constriction

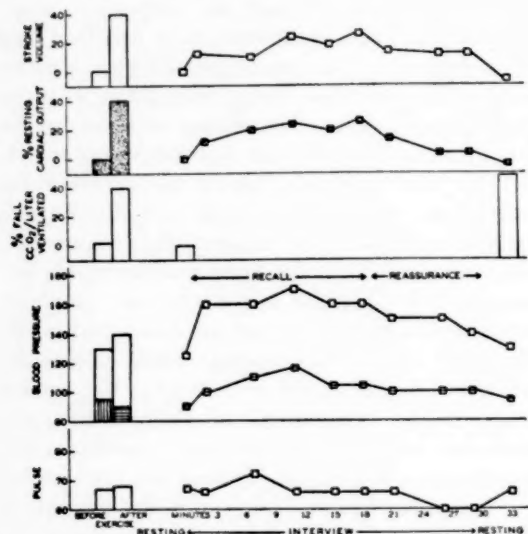


FIG. 4. Palpitation and dyspnea caused by increased stroke volume, hyperventilation and a pressor response associated with suppressed rage.

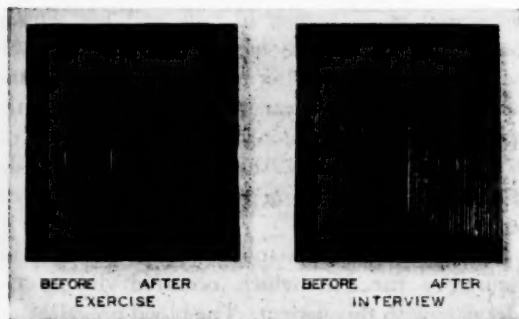


FIG. 5. Spirograms showing hyperventilation before and after exercise and before and after a period of suppressed rage.

in the throat, palpitation and shortness of breath. These symptoms stemmed from an increased stroke volume (section B) and increased respiratory ventilation. The patient did not have paroxysmal nocturnal dyspnea associated with failure of the myocardium, but she nonetheless was shown to have under circumstances of stress increased minute ventilation, increased stroke volume and increased cardiac output. The patient had no symptoms of

hypertension, but after three days in the hospital not "on bed rest" her blood pressure fell from 180/120 to 130/90. The removal of the patient from her environment, which was stress producing, was probably a major factor in this change. It is true that her activity in the hospital was less than at her work and at home. It should be noted, however, that after three days in the hospital, during which she was appreciably reassured and had restful nights, her systolic blood pressure rose only 10 mm. after exercise. The ventilatory response to stress-producing situations was the cause of dyspnea in this patient.

4. Dyspnea caused by hyperventilation and congestive heart failure in an anxious female with hypertensive cardiovascular disease.

A 50-year-old female with hypertension and a history of a cerebral vascular accident complained of cough. The patient was a tense, hyperactive, independent widow, who was lonely and did not want to burden her children. She thus assumed an active social life which included moderate drinking, long walks, late hours, and ocean swimming. Her cardiorespiratory symptoms developed in this setting. Examination revealed a restless female with obvious dyspnea, a dry cough and orthopnea. The neck veins were engorged. The blood pressure was 220/120, pulse 95, respiration 28. Percussion and auscultation revealed no signs of pulmonary engorgement. The heart was enlarged and the precordium heaved with each cardiac systole. Gallop rhythm was present, and a pulsus alternans was noted. Slight ankle edema was observed; the liver was not enlarged. The patient refused to go to bed and followed diet and fluid instructions inadequately. She was "digitalized" in forty-eight hours to the point of nausea and vomiting. At that time, although she still complained of dyspnea, examination revealed only sighing respirations at a rate of 16. The cough was absent. The lungs were clear, and the heart rate was 60/min., with no gallop rhythm or pulsus alternans. Ankle edema had disappeared. The patient stated that she had noted for several years that when she was tense or anxious she would have a feeling of suffocation and would have to sigh to obtain a deep, satisfying breath, even at rest.

The dyspnea which persisted following "digitalization" was of this order. When examined during congestive heart failure the patient was more concerned with the occasional cough than with the persistent shortness of breath, although she realized in retrospect that her dyspnea before "digitalization" was more than that experienced by her during

periods of stress. Her voluntary statement after "digitalization" was, "I always breathe deeply when I get nervous. The cough was what bothered me. The shortness of breath is better now (sighing). I always have this when I'm nervous."

Comment: This patient had two types of dyspnea which merged into one another. One was associated with pulmonary vascular engorgement and was reduced by digitalis, and the other was associated with impairment of the ventilatory mechanism of respiration in response to her disturbing life situation. The effect of morphine and reassurance on patients with acute pulmonary edema suggests that the above two or more mechanisms play a rôle in the production of dyspnea in many patients.

General Consideration Concerning Dyspnea

Christie (14) has shown that the respiratory pattern of "psychoneurotic persons" differs strikingly from that of the average relaxed individual. Finesinger (22) has demonstrated that "unpleasant thoughts" are associated with increased depth and rate of respiration. The mechanisms by which hyperventilation occurs under these circumstances is in doubt, but some data are available.

1. The hyperventilation observed under these circumstances is probably not the result of an increased CO_2 content of the blood. Indeed, Lewis (36), and Soley and Shock (52) have demonstrated alkalosis in patients with neurocirculatory asthenia who are hyperventilating, the former resulting from the loss of CO_2 .

2. Since the vital capacity of normal individuals remained uniform from day to day even in association with unusual emotional reactions, and since study by us of the return of the overdistended lung to the resting expiratory level from day to day revealed no evidence of variations in parenchymal lung engorgement in normal persons, it is inferred that parenchymal engorgement of the lung is not a factor in the production of hyperventilation in these studies (15).

3. The facts (a) that the dyspnea noted in the above experiments was associated with untoward emotional states and evidence of autonomic activity (tachycardia, sweating and flushing), and (b) that strong visual, auditory and noxious stimuli can give rise to deep breathing and gasping demonstrate that the production of hyperventilation, or at least its instigation, involves nervous mechanisms. Further evidence that neural mechanisms are involved is afforded by the observation of Harrison (32), who described the sudden onset of dyspnea in patients with heart failure, following single in-

duced coughs. He has also been able to produce increased rate and depth of respiration in normal patients and dogs by passive movement of an extremity (33, 1). In dogs, this reflex was not abolished by interruption of blood flow from the extremity but was by denervation. Best and Taylor (10) state, "The greater pulmonary ventilation caused by muscular exercise as compared with that resulting from the inhalation of CO_2 is due, it appears, to reflexes originating in the contracting muscles and also to irradiation of impulses from the motor cortex to the respiratory center." These experiments suggest how the contractile state of skeletal muscle in posture and bodily movement associated with various emotional states may be linked with respiration. For example, if a discouraged, dejected individual listlessly approaches a task of lifting a weight or climbing stairs, the act is done so awkwardly that many more than the usual proprioceptive end organs are stimulated, and hyperventilation results. This barrage of afferent impulses may, then, directly or indirectly, exert an influence upon the respiratory center. That this is not alone the result of a greater oxygen requirement for muscles inefficiently used was demonstrated by the fact that the oxygen consumption was not increased in proportion to the increased ventilation in these experiments.

4. Increased oxygen requirement in association with disturbing emotions may act indirectly in the production of dyspnea. Thus, Ziegler and Levine (73) have shown that unpleasant recollections may cause a 25 per cent rise over the basal metabolic rate. Benedict (9) and Segal *et al.* (50) have also observed an increase in oxygen consumption under analogous circumstances. However, in the present experiments, the oxygen consumption was unaltered when the ventilation increased, which makes it unlikely that increased metabolism was significant in the production of dyspnea.

5. Faulkner (21) observed in a man being bronchoscoped that suggestions that engendered feelings of insecurity caused the lumen of the bronchi to become smaller in diameter. It is conceivable that such a mechanism could operate in the above discussed experiments of this study. However, since expiration was not prolonged despite an increase in tidal volume, it is improbable that the mechanism described by Faulkner was involved in the dyspnea observed.

B. PALPITATION

Palpitation may constitute the only or most troublesome symptom of patients with seriously damaged hearts or of patients with cardiac neuroses.

There would seem to be little doubt that the tissues surrounding the normal heart are being stimulated at all times. Each contraction of the heart muscle converts energy into several forms: it gives acceleration to the mass of blood in the ventricles, which sets up a mechanical recoil which can be measured by the ballistocardiograph (53); the mechanical energy from this complex force and other sources of mechanical energy give rise to vibrations in part detected as sound, as demonstrated by the stethograph recordings or the total vibrations measured by the vibrocardiogram (35). Tissue adjacent to the heart may be stimulated by these vibrations, or actual displacement of the tissues may be produced by the movement of the heart itself. But few of the effects of such stimulation reach consciousness.

Palpitation may be defined as sensations, usually painless, experienced in the chest or over the heart and presumably arising from the heart or its adjacent tissues. There is no evidence to suggest that the sensory threshold in the periphery is lowered during the period of palpitation. Changes in the intensity or frequency of stimuli caused by the beat of the heart may be associated with (a) increased stroke volume; (b) displacement of the heart or tissues around it so that tissues ordinarily not stimulated by the beating heart are in a position to be stimulated; (c) occurrence of a beat out of phase with preceding and succeeding beats; and (d) rapid beating of the heart.

It has been shown (5, 13) that when the fibrous pericardium adjacent to the diaphragm is stimulated, the subject experiences sensations of touch and pressure and pain. Capps (13) has "tripped" the apex of the heart with a wire and induced feelings of distress and apprehension but no pain.

There are a number of disorders of the heart in which palpitation is common, and probably stems from one or more of the above-mentioned mechanisms. Thus, although auricular fibrillation is associated with a reduced cardiac output (61), the stroke volume is extremely variable as evidenced by the pulse deficit. After a "run of beats" with a small stroke volume, a beat of large stroke volume may produce a sensation arising from the region of the heart. The rapid rate or the occurrence of beats out of phase may be responsible for the palpitation in this disorder.

Premature contractions may give rise to palpitation because the beats occur out of phase (26).

Awareness of the heart beat may occur with change of position so that the apical impulse impinges against the chest wall. When a person with a thin chest wall lies on his left anterior chest in

bed, he becomes aware of his heart beat. The apex impulse against clothes may give rise to cutaneous touch sensation sometimes causing palpitation. Marked hypertrophy of the heart may also cause movement of the structures of the chest wall to produce palpitation.

It is obvious that the presence of these disorders is not the sole factor in the production of the symptom, as patients demonstrating these defects, such as auricular fibrillation, incomplete heart block or tachycardia, may not have palpitation. Although in each case an apparently adequate stimulus is present, it does not necessarily give rise to sensation. Perhaps conditioning and attitude are concerned with the perception and reactions to these stimuli. Situations which exert such conditioning effects may also serve to effect changes in the pulse rate and stroke volume. Whitehorn *et al.* (70) have demonstrated that the pulse rate may change in response to the recall of, as well as to the presence of, disturbing situations. The following experiments show that an increase in the stroke volume may be associated with palpitation in a setting of conflict and such feelings as anxiety, fear, anger, resentment, aggression, and tension.

1. *Palpitation associated with increased stroke volume during periods of suppressed rage.*

A 33-year-old colored female (see section A, figs. 4 and 5) complained of nocturnal attacks of dyspnea and palpitation. She was found to have hypertension with no evidence of heart disease or irreversible vascular disease. During an interview concerning her life situation, under the experimental conditions, she recalled events producing fear and anxiety. Among other responses to the recall of these stress circumstances, the stroke volume rose about 20 per cent over the resting level and fell on reassurance to the resting level. It became evident that she dwelled upon her difficulties when alone at night, and the recall of these resulted in increased stroke volume and palpitations, conditioned by the fear of death and suicidal thoughts, and while dwelling upon the insolubility of her situation increased stroke volume was associated with appreciation of stimuli arising in the tissues about the heart, and the symptom of palpitation occurred.

2. *Palpitation associated with increased stroke volume during a period of conflict.*

Subject 1 was in the state of anxiety and tension prior to giving a lecture (see section A, fig. 1). Exercise was followed by palpitation or awareness of a forceful heart beat. Measurements showed, among other things, that the stroke volume was elevated 15 per cent above the resting level three

minutes after exercise. Figure 11 shows that the intensity of vibrations in the first heart sound can be correlated with the amplitude of the stroke volume in this individual. Therefore, exercise in the presence of a stress-producing situation results in a stroke volume which remains at a higher level than usual after exercise and is associated with more intense heart sounds, which could provide an adequate stimulus to the production of palpitation.

3. *Palpitation associated with increased stroke volume and suppressed resentment and anger: Dissociation of blood pressure and cardiac output response to exercise.*

Following a period of sustained effort with frustration, on October 10, 1944, subject 1 was exhausted and tense. The previous night he had been wakeful, and what sleep he had was colored by dreams with murderous content. As a result of this bad night he had decided to slow down and assume fewer responsibilities for a brief period. As a matter of fact, however, circumstances so shaped themselves that such relaxation was impossible, and he was obliged to assume more than the usual workaday burden. Under these circumstances of conflict he became resentful and tense. He felt unsupported, vulnerable and prostrated, and figuratively snarled in self-protection. The picture was one of a man fighting with his back to the wall. The behavior was that of one who was simmering with resentment. (Case notes included the following descriptive comments: Underactive, cynical, smouldering resentment, prostration, snarling, grumbling, with but little talk, muttered imprecations.) The subject did not exhibit pallor, cold hands, sweating, or flushing. Figure 6 reveals that the pulse had returned to the resting level within two minutes after exercise, and the blood pressure which was low initially had also returned to the resting level. The ventilation was not unusual. Three minutes after exercise the cardiac output was still 25 per cent above the resting level, the level being maintained by an increased stroke volume.

Comment: It is of interest that the bodily reaction as far as here studied was minimal, with the exception of the cardiac output, which was still elevated three minutes after exercise, suggesting that the mood and most of the circulatory reactions were suppressed. This pattern of response appears to have a minimal component of change in the contractile state of the peripheral arterioles, although adequate cause for palpitation is exhibited in the increased stroke volume. This minimal reaction is in contrast to that which is described in the following section in which reactions are overt and hyper-

dynamic. Grollman (30) states that the cardiac output, increased in response to emotionally charged situations, returns to its resting level coincident with the fall of pulse and blood pressure. The above experiment shows that this is not always observed. Indeed it demonstrates a dissociation between the rate of fall of the cardiac output and systemic arterial blood pressure after exercise. Starr (57) has also observed an analogous dissociation of blood pressure and cardiac output. He has demonstrated

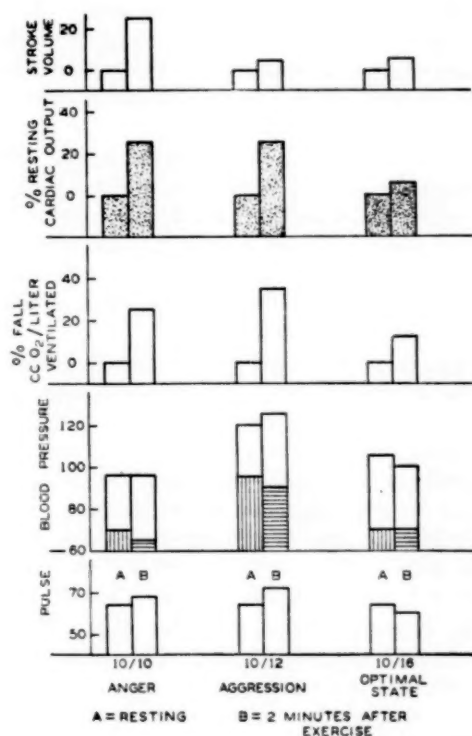


FIG. 6. Palpitation and increased stroke volume after exercise in association with anger. Note the dissociation of pulse rate, stroke volume and pressor response during different affective states.

that the blood pressure rise in some patients with neurocirculatory asthenia is caused by an increase in the cardiac output, while the rise in blood pressure in some patients with essential hypertension is the result of increased peripheral resistance. Palpitation associated with increased stroke volume may occur without alteration in other categories of cardiovascular function.

4. *Palpitation and increased stroke volume in association with overt expression of anger and aggression.*

After a series of contacts with a group of fellow workers, with whom various aspects of their work

was being evaluated, subject 1 gained the impression that the dominant note in the exchange was deceit, pretension and affectation. The period was culminated by discussions at a formal scientific meeting in which essentially the same content was noted. The subject was thrown into a tense, resentful, depressed, angry, hostile state. He complained of feeling isolated, alone and unsupported by his fellow workers, who were important to his security. The dominant emotional reaction was rage, outwardly manifested as irascibility. (Case notes include the following descriptive comments: Talkative, scolding, noisy, swearing, enraged, irascible, tense, overactive, gesticulating, angry looking, flaring anger resembling a temper outburst, desire to lash out in self-protection.)

The results of the experiment on October 12, 1944, are shown in figure 6. The pulse was unchanged. The resting blood pressure was higher on this day than was usual and after exercise did not return to even the pre-exercise high level. The utilization coefficient fell, and the cardiac output was elevated three minutes after exercise.

Comment: In this instance the subject's behavior was characterized by overt expressions of anger and aggression. Peripheral vascular as well as the cardiac output changes after exercise were noted. The increased stroke volume constituted an adequate stimulus for the production of palpitation.

5. Palpitation and the prolonged elevation of the cardiac output after exercise associated with tension.

Subject 1, emotionally dependent upon his wife, was significantly influenced by her state. Hence, when through the pressure of her own professional responsibilities she became preoccupied and failed to render support, the subject became resentful, aggressive and tense. It was during such a period when, on November 9, 1944, for reasons which were not identifiable, the subject was tense and anxious and became especially aware of the pre-occupations of his wife. He felt unsupported and resentful, and experienced a period of dejection with tension.

The cardiorespiratory functions on November 8 and November 9, 1944, are shown in figure 7. It will be noted that the cardiac output remained elevated as long as ten minutes after exercise, even though the other functions had returned to the resting levels by two minutes.

Comment: The above commonplace incident demonstrates that palpitation may persist after exercise when other evidences of increased cardiovascular function have returned to resting levels.

6. Palpitation and increased stroke volume in association with resentment and anger.

Subject 2 received a bill, after the illness described in section A, which seemed unjustifiably large and implied a lack of appreciation for years of faithful service. Actually she considered herself an old and valued worker. The magnitude of the bill implied to her that this was not the case and that she did not hold a favored position in the eyes of the institution where she worked. She looked and acted as though angry, experienced palpitation, and the dominant affects were feelings of being injured, resentment and fear of being humiliated in front of those who felt that her prolonged hospitalization was unnecessary. The associated response of

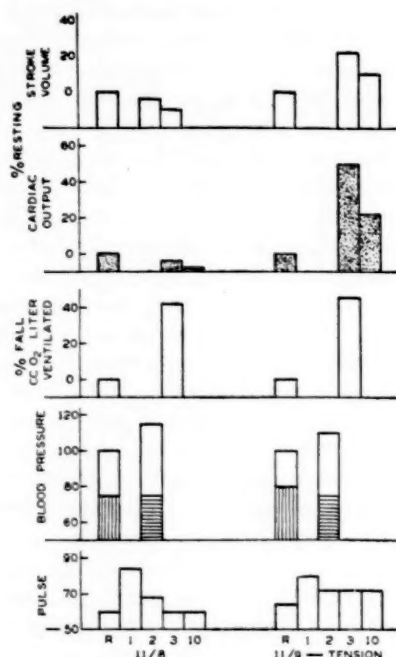


Fig. 7. Palpitation and prolonged elevation of the stroke volume after exercise during a period of tension.

the cardiovascular system included an elevation of the blood pressure, pulse and cardiac output after exercise (see fig. 2).

7. Palpitation and increased stroke volume associated with anxiety and following guilt dreams.

Subject 2, in August 1944, had committed herself to the care of an alcoholic friend. Her home situation so altered in the interim that it became manifestly impossible for her to assume this added responsibility. She therefore rejected her friend. She felt anxious and guilty in not assuming this responsibility to which she had committed herself, because her convictions about loyalty gave this decision great significance. On November 24, 1944, during the night after the decision, the patient experienced a dream which implied guilt and anxiety.

The dream was extremely vivid, well organized and consistent. The topic was about exposure and public disapproval, finger of scorn, letting someone down, and shame. "There was no escape despite much travel." The content was guilt, anxiety and attempts at self-justification. She awakened, aware of these conflicts and emotional reactions, which persisted throughout the experiment day in which the following observations were made. The resting level was not unusual, but after exercise the pulse, blood pressure, cardiac output were markedly ele-

period the subject became aware of her body with slight pelvic and breast discomfort and palpitation. Also, the declining energy made her less effective and caused her to drive more to accomplish her ends. She became resentful of "obstructions in her way." Menstruation had its onset on November 11. Figure 9 reveals these mood changes to be associated with elevation in cardiovascular function after exercise. The reactions returned to the usual levels with the onset of the menstrual flow.

Comment: The subject was in such a state in the pre-menstrual period that situations ordinarily easily managed constituted stress, and the total response to these situations was reflected in the function of the cardiovascular system.

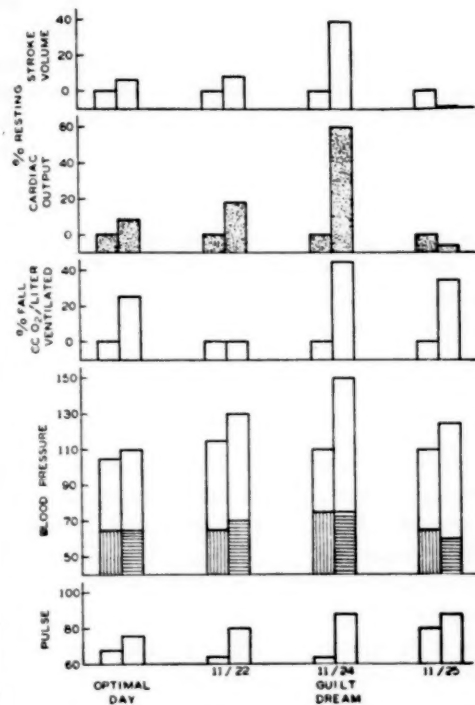


FIG. 8. Palpitation and increased stroke volume in addition to hyperventilation and a pressor response to exercise on the day following a guilt dream.

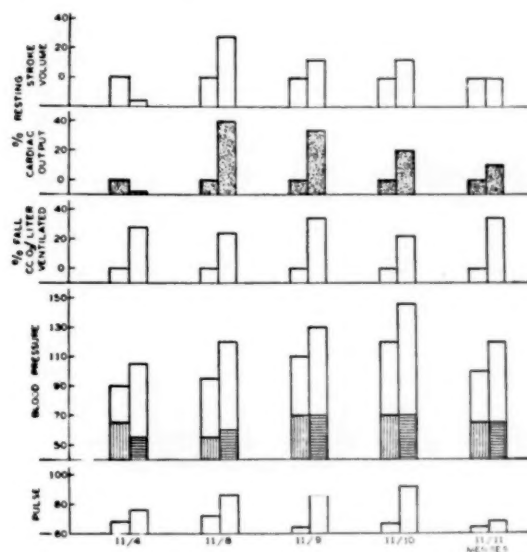


FIG. 9. Palpitation and increased stroke volume during a period of premenstrual tension.

9. Palpitation and tachycardia in an anxious man with a history of paroxysmal auricular fibrillation.

The patient was a 24-year-old male medical student who developed his first attack of paroxysmal auricular fibrillation following a period of extreme anxiety and fear of failure, and the imbibition of about five ounces of whiskey. There was no evidence of anatomical defect of the heart. Following the incident, his anxiety continued and he became, in addition, apprehensive about his heart in spite of reassurance. While in this state he was subjected to the standard Master Two Step test, and observations of his cardiovascular and respiratory functions were made before and after.

In figure 10 it is shown that his cardiac output had returned to the resting level by three minutes after exercise, but his stroke volume was reduced.

ated, and the utilization coefficient was depressed (fig. 8).

Comment: In the setting of marked underlying guilt the subject showed unusual levels of the cardiorespiratory functions after exercise adequate for the production of palpitation and other symptoms.

8. Palpitation occurring during the pre-menstrual period.

Subject 2 was noted to have changes in mood during the period of so-called pre-menstrual tension. From November 8 to 11 there were a series of home and work situations which resulted in mounting tension and frustration in the few days prior to the menstrual period. During the pre-menstrual

His pulse remained high, and his respiration and blood pressure were back to resting levels by three minutes after exercise.

Comment: This subject knew that he had always responded to exercise by a rapid pulse. He may be called a pulse reactor. This potentiality is interesting in relation to the attack of auricular fibrillation in the absence of anatomical heart disease. Levy *et al.* (38) present statistical evidence to support the hypothesis that this patient may be prone to the development of heart disease in later life.

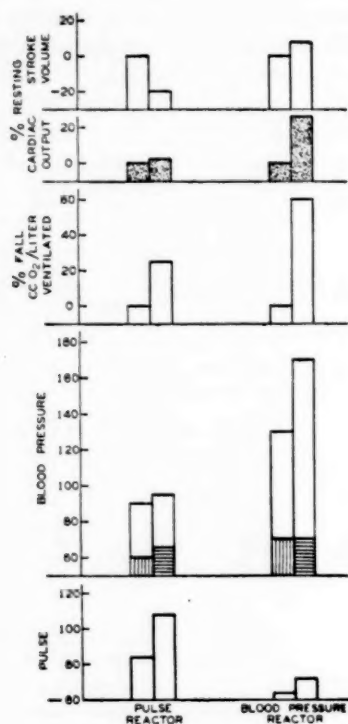


FIG. 10. Palpitation and tachycardia after exercise in a pulse reactor in contrast to increased cardiac output and increased blood pressure unassociated with symptoms in a blood pressure reactor. Both were tense and anxious but reacted differently to situational stress.

10. Palpitation associated with paroxysmal auricular fibrillation in a patient during periods of depression.

A 36-year-old female, without historical or physical evidence of a damaged heart and with a normal electrocardiogram, developed paroxysmal auricular fibrillation during periods of depression. She was a perfectionistic, dependent person who had a long history of recurrent psychoneurotic symptoms. She married in her middle thirties a man several years her senior. She demanded affection and close attention from her husband, who was neither inclined

nor able to provide her with what she considered the requisites of a perfect marriage. After a prolonged period of frustration she would become anxious and depressed. She refused to leave her husband and considered suicide as the solution to her problems. As she became more depressed she would lose her appetite, lose weight and begin to vomit periodically. She became tearful and sleepless. During these periods she would develop frequent premature contractions, and on several occasions developed an attack of auricular fibrillation accompanied by palpitation which would last twelve hours and then subside spontaneously.

Comment: During periods of emotional stress associated with intense activity of the autonomic nervous system manifested by weeping and vomiting, this patient would develop paroxysms of auricular fibrillation.

Sometimes the intensity of heart sounds, the magnitude of stroke volume and the presence of palpitation appeared to be related. To define this relationship the following experimental procedures were undertaken on subject 1.

Relation of Palpitation, Stroke Volume and Intensity of Heart Sounds

It was noted in subject 1 that on days when the stroke volume was elevated for a prolonged period after exercise, he usually experienced prolonged palpitation after exercise. Inasmuch as palpitation in this subject was found to be associated with an increased recoil of the heart, as evidenced by an increased ballistocardiographic stroke, a study of the sound vibrations elicited from his heart was attempted. A Cambridge stethograph was used. Since variations in the position of the pick-up microphone, the intensity of pressure of the microphone bell against the chest wall and the setting of the volume control are known to interfere with the reproducibility of heart sounds, the following plan was adopted and observations were made daily during a month.

After the subject had finished the exercise and returned to the ballistocardiograph bed, the microphone was strapped to the chest, the volume control adjusted and records of the heart sounds, in addition to the ballistocardiogram, were taken at one, three and ten minutes after the end of exercise. The percentage fall in intensity of the first heart sound from one to ten minutes after exercise was plotted against the percentage fall in the stroke volume during the same interval, and the resultant curve is shown in figure 11.

Comment: From perusal of the data, it is apparent that increased stroke volume, palpitation and increased intensity of heart sounds sometimes occur together. However, there were other occasions when palpitation and increased stroke volume could not be demonstrated to be related to increased intensity of the heart sound. This is not surprising when it is appreciated that there is probably no intimate relation between the displacement of the intrathoracic sensory end organs and the change in vibration responsible for the increase in heart sounds. It would seem reasonable to expect that occasionally, when the magnitude of the stroke volume change was great enough, such

always experience palpitation. For example, the attention of a patient can be drawn to the heart by means of the perusal of an insurance advertisement, a "check up" by a physician, a visit to a draft board, or the death of a friend from heart disease. If in such a circumstance the patient is having premature contractions, is lying on his left side in bed, is wearing a tight article of clothing about his chest, has indulged in unusual exertion, has experienced fear, or has an enlarged heart, auricular fibrillation, or some other arrhythmia, he may experience palpitation. In other words, certain attitudes as a result of conditioning in conjunction with minimal mechanical stimuli may result in palpitation. Either, alone, may produce no symptoms. Having once suffered the experience of palpitation, if the patient develops anxiety or fear of heart disease, increased attention to this area of the body plus a stimulus in the form of increased recoil of the heart or rapid pulse, associated with fear and anxiety, may potentiate the "vicious cycle," and the troublesome symptom of palpitation will exist. It is generally known that palpitation associated with premature contractions will disappear upon reassurance that heart disease is not present, although the premature contractions may persist.

Finally, since arrhythmias are so commonly associated with palpitation, their relation to distressing life situations and concomitant emotional reactions should be considered. It is known that the pulse rate and the electrocardiogram may be altered during fear or fright. It has been demonstrated above that a young man during a period of anxiety experienced paroxysmal auricular fibrillation with palpitation. Part of his reaction to exercise included a marked pulse rise with a slow fall to normal.

Premature contractions, paroxysmal auricular tachycardia and paroxysmal auricular fibrillation may be precipitated by disturbing life situations (69).

C. HEART PAIN

Pain arising from the heart is related to the amount of blood which the heart muscle is receiving through the coronary circulation and to the amount of work which the heart muscle is called upon to do. If the coronary blood flow is diminished by arteriosclerosis, by arterial thrombosis or by contraction of the arterial musculature (28), and is unable to meet the demands of the heart muscle, pain will result.

There are two types of reactions to adverse life situations which will be discussed in detail below, both capable under certain circumstances of produc-

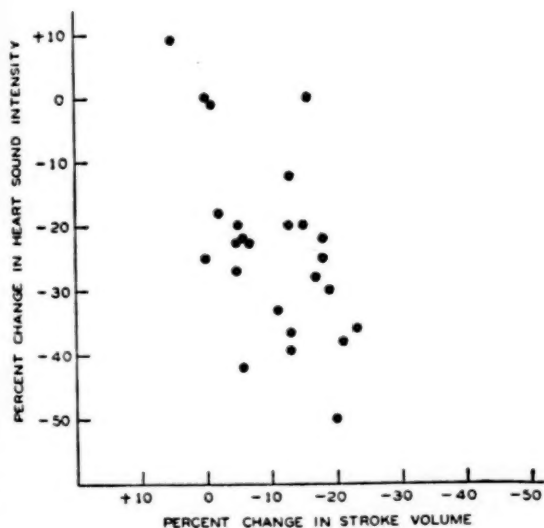


FIG. 11. Graph showing that although palpitation was associated with increased stroke volume, this was often though not always associated with corresponding changes in the intensity of heart sounds.

changes would reflect themselves in increased sound intensity.

General Comment: From these data it is inferred that a significant change in stroke volume or in heart rate will cause mechanical disturbances such as traction and displacements within the chest, thus constituting adequate stimuli for the sensations interpreted as palpitation. It is, however, also apparent that subjects' attitude toward these sensations may become of major significance and be a factor in a chain of circumstances which accentuates or perpetuates the symptom. This may explain the frequent occurrence of palpitation in anxious patients with cardiac "neuroses," with and without structural cardiovascular disease. It may also indicate why patients with apparently adequate stimuli such as occur in auricular fibrillation do not

ing pain. The first of these reactions calls for increased work of the heart, with either increased or constant coronary blood supply, and the second for a sustained amount of work from the heart in spite of a decrease in coronary blood supply.

The following protocols demonstrate the work demands upon the heart made during certain adverse life situations and concurrent feeling states. The first two protocols are those of younger persons in whom the demands of the heart muscle could be fulfilled by the coronary blood supply. The third protocol is of a patient in whom the demands upon the heart muscle were not only greater, but the coronary circulation was less adequate, with resultant pain.

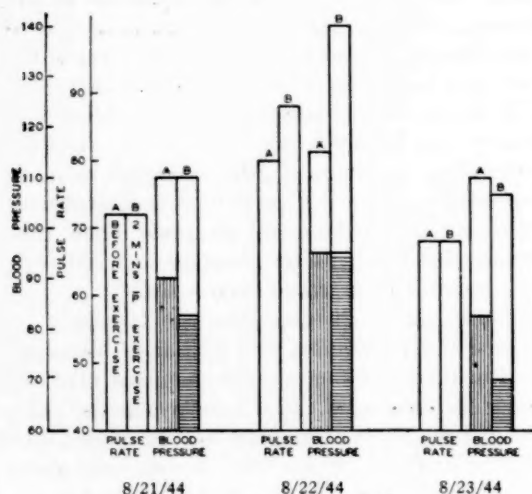


Fig. 12. Increased work of the heart after exercise (diminished exercise tolerance) during a period of fear.

1. Increased work of the heart associated with fear.

On August 22, 1944, after examining his acutely ill child, subject 1 concluded that his son probably had anterior poliomyelitis. The dominant emotional response was fear. In contrast to the usual resting pulse rate of 68 per minute, the pulse rate was 80 per minute. Two minutes after exercise the pulse rate was 88 per minute, contrasted to 68, and the blood pressure was 140/95, contrasted to 105/70 (see fig. 12).

Comment: A period of stress associated with fear resulted in a rise in the resting blood pressure and pulse rate, and a less rapid recovery from the effects of exercise. In no instance in the nine months of observations was there so sustained an elevation of the resting or the post-exercise pulse rate. Furthermore, on no other occasion was the combination of pulse acceleration and elevated systolic blood pres-

sure observed in this individual. Under these circumstances the work of the heart was presumably increased and the myocardial requirements for blood augmented. The coronary blood supply was adequate to meet the demands of the myocardium.

2. Increased cardiac work in a driving, perfectionistic man.

The subject was a 24-year-old male medical intern. He was an ambitious, driving, meticulous person who felt insecure in the hospital post he had achieved because of good academic performance, and was under considerable stress in maintaining the standards which he believed were inherent in his job. He was extremely sensitive to disapproval and was uncertain whether or not his performance was successful. He worked under tension. He enjoyed good health and had no complaints.

The response of the function measured is illustrated in figure 10. It will be noted that for a given amount of exercise for his age and weight, which in most persons results in a return of the pulse and blood pressure to resting level by two minutes after exercise, the blood pressure, cardiac output and the fall of the utilization coefficient were unusually high. The pulse reaction was not marked.

Comment: This observation represents an instance in which work of the heart was increased, in that blood pressure and cardiac output returned to resting levels slowly after exercise. Stead *et al.* (60) and Grollman (30) have also shown that the cardiac output may be increased in response to stress-producing situations. As shown by Thacker (62), this is a characteristic response of persons who have an elevated blood pressure under the stress-producing circumstances of a "physical examination." Levy *et al.* (37) have shown that those who have transient rises of blood pressure under the circumstances of such a medical examination are more liable to develop hypertensive disease, which is commonly associated with angina pectoris in later life. In any event, given anatomical impairment of the coronary blood flow, such a patient is prone to the development of coronary insufficiency as illustrated in the following protocol.

3. Increased cardiac work and precordial pain associated with rage in a man with hypertensive cardiovascular disease.

The subject was a 50-year-old Jewish male "cloak and suit" worker who had transient hypertension ten years before. He complained of substernal pressure and painful precordial sensations not related to exercise, lightheadedness on exertion and head-

ache. His symptoms had appeared following a recent upper respiratory infection. His examination revealed a blood pressure of 210/120 and a slightly enlarged heart. His electrocardiogram showed depression of ST 1 and 2 and low amplitude of T 1 and 2 and slight left axis deviation. The patient was interviewed on the ballistocardiograph bed, and respiratory, pulse, blood pressure, and cardiac output measurements made. The interview revealed that the subject had an uncompromising, demanding wife who imposed her relatives upon the patient in his business, who "cared" little about his personal well being. She complained when the patient felt obliged to visit his aged mother; but when the patient acquiesced to her demands and remained at home, she went out to visit her friends and left

graphic changes were produced by the Two Step test.

Comment: The cardiovascular reactions in association with rage in this patient, with presumed irreversible vascular disease, are comparable to those found in subject 1. It is of interest that the electrocardiographic changes resembled those seen after ergotamine in patients with neurocirculatory asthenia (68). Loftus, Gold and Deithelm (39), and Mainzer and Krause (40) have demonstrated electrocardiographic changes associated with fear. Graybiel *et al.* (29) and Thompson (64) have made relevant observations. Master, Nuzie, Brown, and Parker (42) have described in a given patient greater changes in the electrocardiogram during periods of "intense nervousness" than could be produced by the Two Step test or by breathing 10 per cent oxygen when the patient was "at ease."

The second category of "heart pain" or precordial discomfort in association with adverse life situations includes, as mentioned above, those instances in which sustained demands on heart muscle are not accompanied by increase in cardiac output but may indeed be accompanied by a decrease. This combination may lead to pain and, possibly, to coronary thrombosis.

1. Decrease in the stroke volume associated with hypodynamic states and its relevance to diminished coronary blood flow and precordial pain.

On October 23, 1944, shortly before the observations of the day were made, subject 1 was interviewed by a special feature writer from a well-known pictorial weekly concerning a proposed popular article on a medical topic in which he was deeply interested. The subject reacted enthusiastically to the proposal and gave considerable information to the reporter. Some of the information essential to an adequate statement of the problem was still unpublished. He was in conflict, but this he resolved because he was convinced that the popular magazine article would exert a widespread constructive influence. He was also certain that the data would have reached the stage of formal presentation by the time that the popular article was to be published. However, after the experiment he discussed the matter with his senior officer who assumed a non-committal, judicial attitude and failed to support the subject in his decision. This roused the conflict, and the subject developed feelings of guilt and a conviction of lack of support—akin to betrayal.

On the evening of October 24, a group of friends, supposedly sympathetic persons with ostensibly the same values as the subject, announced their aban-

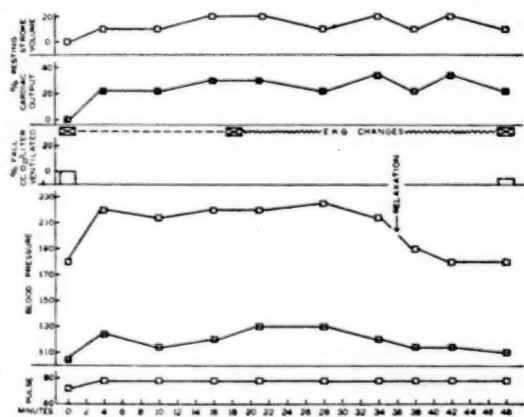


FIG. 13. Increase in blood pressure and cardiac output (cardiac work) in association with rage. E.K.G. changes and precordial discomfort indicated by wavy line. Relaxation suggested but incompletely achieved indicated by arrow.

the patient alone. While describing these facts, the subject at first sobbed and then became angry and poured out examples of his wife's iniquities. He complained that the "aggravation" aroused by the discussion was characteristic of what he experienced much of the time, especially when at work or at home. Specifically he noted choking sensations, substernal pressure without radiation and occasional giddiness. Figure 13 shows that the blood pressure and cardiac output rose during the interview. The electrocardiogram changed slightly but definitely towards a more normal configuration with elevation of the ST segments and of the T waves which Master considers a positive test for coronary insufficiency. The functions did not return to resting levels at the end of the interview and reassurance was not effectively produced. Respiratory tracings showed shallow rapid respirations identical before and after the interview. The same electrocardio-

donment of these values and the adoption of an entirely different orientation. This was the second of a series of assaults through which the subject's props were cut from under him, reinforcing his feelings of lack of support and of having been "sold down the river." These reactions and moods persisted through October 27. Throughout this time the subject experienced feelings of sadness, bewilderment, cynicism, and defeat, and felt, figuratively, as though the bottom had dropped out and he had had the "heart taken out of him." He complained that he had slept poorly, had no energy and had lost interest in his work. He listlessly attended his responsibilities. (The case notes included the following descriptive comments: bewildered, confused, saddened, "not knowing where I stand,"

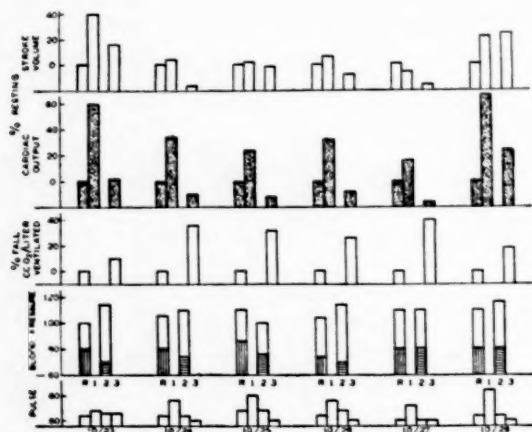


FIG. 14. Cardiovascular function (fall in stroke volume after exercise) during a hypodynamic state. 10/23 and 10/28 are considered optimal days.

feelings of being "let down by those I felt would support me," shakiness, slightly facetious—subject taps fingers against bed. Subject's initial statements, however, were "in good spirits, slightly tense, good energy, and good effectiveness." The last day of the series he said, "I'm weary—it's the end of a long series of long days.")

Figure 14 demonstrates the cardiovascular and respiratory functions before and after exercise during this disturbed period. It will be noted that the resting pulse, blood pressure and cardiac output were low and that after exercise they fell to levels actually below the resting levels. The fall in cardiac output was due not only to a fall in pulse but to a fall in stroke volume as well.

Comment: The reaction described in subject 1 was a less common response to assault and in essence was a lying down or failure to strike back. The defeatist feeling seemed to be reflected in the

bodily reactions. It may be analogous to the "sham death" or collapse reaction seen in sheep, opossums and sometimes in man. It is probable that this fall in cardiac output represents a defect in venous return to the heart caused by pooling of blood in the periphery. Since hyperpnea existed in all of these subjects, it is unlikely that the fall in venous return to the heart is of respiratory origin. Starr (56), using the ballistocardiograph, found in a group of people including both healthy and "sick" persons that a burden analogous to exercise, namely, assuming the erect position or merely the stress produced by the experimental procedure, caused a decrease in the cardiac output. Starr and Jonas (54, 55) have also described a syndrome of subnormal circulation. Thacker (62) has studied the effect of repeated blood pressure examinations on young men. He has found that those with arterial hypotension on initial medical examination were on subsequent examinations found to have normal levels of blood pressure just as the blood pressure in young men with hypertension falls to normal levels. It appears that an initial examination is a stress-producing situation and that the response may be either blood pressure elevation or depression. With reassurance and familiarity with the procedure, the blood pressure falls or rises to normal levels in subsequent examinations.

Bansi and Grosscutt (8) noted a marked drop in the minute output and stroke volume after exercise in a patient who happened to have mitral stenosis. Simonsen and Enzer (51) state that collapse may be observed in normal subjects after heavy exercise. Whitehorn *et al.* (70) have described decelerations in the pulse associated with feelings of "dejection, aversion and resignation." Ziegler and Levine (73) have described a fall in basal metabolic rate with similar feelings. Another indication that hypodynamic responses to stress-producing life situations occur is the frequent complaint of lightheadedness in patients with neuroses. The low blood pressure sometimes found in dejected, discouraged, listless persons may be a manifestation of such a reaction. Hamilton (31) has also observed low blood pressure associated with emotional stress.

The fact that coronary thrombosis occurs frequently in persons with hypertension does not minimize the possible importance of the hypodynamic reaction in coronary thrombosis. A fall in the cardiac output such as noted in the hypodynamic response is not necessarily related to the resting level of the blood pressure. Therefore, in the presence or absence of arterial hypertension

the hypodynamic reaction with a fall in cardiac output may significantly alter the coronary blood flow. Such reactions may be important in patients with coronary artery sclerosis or other heart disorder which impairs coronary circulation. If the blood supply is inadequate to the needs of the myocardium, precordial pain may result. It is of interest that Dunbar (20) has observed in some patients with coronary occlusion that "the major emotional factor was usually a disappointment in relation to vocational life: 'After working so hard all those years, I had just reached the top and was happy, when this happened, and it was all taken away'; or, 'I wasn't my own boss any more.' Although death or illness of parent or spouse was usually mentioned as having occurred just prior to the onset of the illness, the patient was inclined to minimize the emotional importance to him of such events; instead, the specific reference was likely to be to eating or nightmares about fighting or to financial reverse."

That the hypodynamic reaction may be relevant to the production of "heart pain" in certain instances of "angina pectoris" is demonstrated by the following protocol.

2. *Precordial pain and diminished stroke volume associated with feelings of rage, desperation and defeat in a patient with angina pectoris.*

A 46-year-old man with a characteristic history of angina pectoris but with a negative electrocardiogram and anoxemia test was studied. The electrocardiogram did not change after exercise even though pain was produced. The patient was interviewed while the various physiological functions were recorded. He told of having a common-law wife whom he loved. This woman was unfaithful and he bitterly resented her "affairs" with other men. He also resented the fact that his son was kept in a foster home by the courts. His precordial pain initiated by effort was usually present while at work and during the exertion of walking away from the foster home where he had left his son, after their weekly visit.

During this account the patient became very angry, and his face flushed. His mood changed from anger to desperation as he related that his wife would neither remain faithful, assume any responsibility for their child nor give him its custody. He had tried every device from persuasion to threats, having once been arrested for carrying a revolver, but all to no avail. While discussing his wife's promiscuity and shameless irresponsibility towards their child, he uttered a loud, sardonic, prolonged laugh. He wished to have the child

cared for in his sister's home under his own guidance but he felt helpless before his wife's scorn and under the court's decision that the child should remain in a foster home. He saw no avenue of escape, no hope for the resolution of his dilemma.

Observations during the interview are shown in figure 15. There was a slight pressor response. There was a fall in the pulse rate and a fall in the stroke volume. During the interview the patient complained of precordial pain, although electrocardiographic changes did not occur.

Comment: This subject demonstrates a fall in the cardiac output in spite of a slight rise in blood pressure in response to recall of affect-laden facts. It is possible that the fall in cardiac output was reflected in a decrease in the coronary circulation,

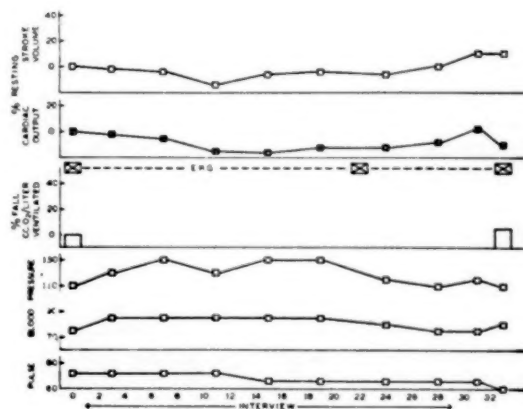


FIG. 15. Fall in cardiac output and stroke volume, and the occurrence of precordial pain during a period of frustration and feelings of defeat.

especially if coronary artery constriction (28) were associated with the slowing of the heart (increased vagal activity). The supply of blood to the myocardium would be enough below the demand of the heart muscle to result in relative anoxemia and pain. In all events, in this patient pain occurred when the cardiac output fell.

3. *Myocardial anoxemia associated with pain occurring during sleep in a desperately unhappy, dejected man.*

A 35-year-old normal healthy male took a vacation during which he led a very active life. On one occasion he ran 100 yards in a foot race at top speed without experiencing precordial pain. One week after returning home he retired for the night and awakened with aching substernal and precordial pain which persisted for three to four hours. An electrocardiogram revealed depression of ST 2 and 3 and negative T 2 and 3. The QRS complexes

were not involved. The patient recovered after three weeks' bed rest and was asymptomatic. The electrocardiogram returned toward normal in six weeks. The presence of fever, leukocytosis and elevated sedimentation rate were unknown.

Questioning as to his feelings preceding the coronary accident on the night of the episode revealed that the patient was dejected, lonely and bored prior to retiring, but the state itself was not unusual for him.

Comment: It is probable that little coronary artery narrowing was present if the patient could tolerate a 100-yard run without pain. Nevertheless, while asleep the patient experienced a serious alteration in his myocardial blood supply. It is possible that diminished blood supply was dependent upon the hypodynamic reaction described above.

It is apparent from the above that both hyper- and hypodynamic reactions are relevant to heart pain. Although it is generally accepted that a rise in cardiac output and subsequent increase in the work of the heart are more effective in producing myocardial ischemia and pain, a fall in minute volume would also decrease the coronary blood flow and, in addition, given a pre-existing occlusive disease of the coronary arteries, could present an optimal state for the development of myocardial infarction. Such a set of circumstances would explain some instances of anginal or coronary thrombosis occurring in individuals during inactivity or immobilization in bed and accompanying surgical shock.

In summary, additional evidence is presented that work performed under emotion-producing stress may be associated with a rise in the work of the heart, myocardial ischemia and cardiac pain, if coronary artery narrowing is present. During stress-producing life situations, reactions characterized by a prolonged elevation of the cardiac output after exercise, or a fall of the cardiac output after exercise below the resting level, have been described.

D. FAINTING AND GIDDINESS ASSOCIATED WITH CARDIOVASCULAR AND VENTILATORY DISTURBANCES

Inasmuch as disturbance of the blood supply to the brain is a common cause of giddiness and fainting, a study of the circulatory and ventilatory functions known to be related to the blood flow in the brain was undertaken. Romano and Engel (48) have demonstrated by means of the electroencephalogram that significant alteration in the electrical activity of the brain occurs concomitantly with the fall in blood pressure in persons during fainting.

To investigate one mechanism of giddiness, cardiac output and cerebral blood flow were decreased by increasing intrapleural pressure. This was done by the method of decreasing venous return as devised by Flack (24) as follows:

The symptomatic and blood pressure changes in response to sustaining a column of water 20 cm. high for twenty seconds by blowing, while the subject passively leaned against a board at a 70 degree angle from the horizontal, were observed in subject 1 daily for a period of three months. On optimal days, which constituted approximately four-fifths of the time, there was but a slight fall in the pulse pressure while sustaining the column of water, and no giddiness. However, protocol No. 1 is a representative instance of those experiments on suboptimal days during which unusual responses were present.

1. Giddiness associated with a fall in pulse pressure during the "Flack test" and during a period of marked fatigue.

The second week in February was a period during which subject 1 was experiencing excessive demands upon his time and energy. He reacted to this situation with feelings of extreme exhaustion, using the word "pooped" to describe his state. He also noted during this period that he felt light-headed upon sudden change of position from supine to upright. The top row of figure 16 contrasts the amount of fall in pulse pressure on optimal days when giddiness did not occur with that on February 13 when the subject experienced giddiness. On that occasion, while sustaining the column of water, he had marked fall in pulse pressure, and therewith he experienced giddiness.

Comment: Gambill, Hines and Adson (27) have demonstrated that similar changes in the response to the Flack test can occur after a prolonged period of immobilization and after sympathectomy. Weiss *et al.* (66) have studied the mechanism of postural fainting after the ingestion of nitrites and have concluded that there is a decrease in venous tone with resultant pooling of blood in the extremities (59). On the basis of the available evidence it is likely that, under circumstances of stress, peripheral vascular changes occur which result in an impaired venous return to the heart. Under these circumstances the added impairment of venous return effected by increasing the intrathoracic pressure may be sufficient to reduce the cardiac output to such an extent that there is decreased cerebral blood flow, with resulting giddiness or fainting.

Another mechanism concerned in the production of giddiness may be hyperventilation with resultant

low CO_2 content of the blood. Thus, Soley and Shock (52) have inferred from their studies that hyperventilation may cause light-headedness in neurocirculatory asthenia. Wolff and Lenox (72) have shown that low carbon dioxide content of the blood may result in cerebral vasoconstriction. Also, the dissociation of oxyhemoglobin at low oxygen tension is inhibited under circumstances of low CO_2 content of the blood (10). These changes may be associated with cerebral anoxia and light-headedness. Forced ventilation readily produces

2. Giddiness during a period of marked fatigue and impaired ventilatory function.

During the same period in February in which subject 1 was exhausted and experienced giddiness on changing position, it was noted on February 13 that not only was the Flack test abnormal, but also hyperventilation after exercise was present. Figure 16 illustrates the increased circulatory response and the increased ventilatory response to exercise on this day of marked fatigue as compared with optimal days.

Comment: It is suggested that hyperventilation occurring during the period of stress contributed to the occurrence of light-headedness when this was added to the burden of change in position or fall in pulse pressure.

3. Giddiness as a result of hyperventilation in a patient with fear of heart disease.

A 60-year-old male, who was a hard worker and was holding down a daytime job in addition to a piece-work job from 7-12 p.m., had been examined by an industrial physician as part of a pre-employment program and told to see a heart specialist. He did, and the "specialist" told him that he had a heart murmur but not to worry about it. The patient, after a year of working at the two jobs, suddenly became very exhausted and quit his jobs to take a vacation. Following the vacation he noted light-headedness at rest, which disturbed him, and he subsequently sought medical advice. The patient spoke and acted as though he were convinced that he had serious heart disease. He felt that the doctors were withholding the serious information from him. Examination revealed a normal blood pressure. There were no signs of an intracranial lesion or of congestive heart failure. There was a harsh systolic murmur at the base, not transmitted, and unaccompanied by a thrill. A_2 was present. The heart was slightly enlarged to the left. An electrocardiogram revealed left axis deviation and some diminution in the amplitude of the T waves. While having the patient overbreathe during auscultation of the lungs, his symptoms were reproduced. The Master Two Step test was normal as regards pulse and blood pressure, but hyperventilation persisted and the patient again experienced a recurrence of his symptoms. It then became clear that the patient was overventilating, and when informed of this the patient in surprise stated he did this voluntarily because he felt that an adequate intake of air was beneficial to a man with heart disease. Explanation and reassurance resulted in disappearance of the symptoms.

Comment: In this instance the occurrence of fear

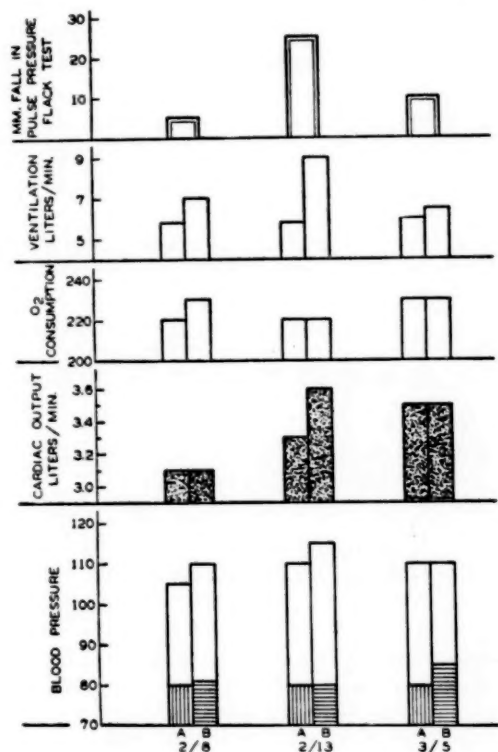


FIG. 16. Giddiness associated with an abnormal Flack test and hyperventilation without increase in oxygen consumption after exercise during a period of marked fatigue on February 13.

giddiness. It has been possible in these experiments to produce giddiness as well as other symptoms of his illness in a young man with hyperventilation syndrome. This was done by allowing him to inhale a low oxygen mixture in a closed system from which the CO_2 was being constantly absorbed. Identical symptoms were readily produced in symptom-free healthy persons by the same procedure. That the changes brought about by hyperventilation may be relevant to the problem of giddiness and faintness occurring in response to stress-producing life situations is illustrated in the following protocols.

was associated with voluntary hyperpnea which resulted in giddiness.

4. Fainting caused by hyperventilation during periods of anxiety, guilt and depression.

A 56-year-old male patient complained of fainting spells for two years. The episodes were precipitated by a feeling of oppression in the chest with the desire to sigh. The patient would then begin to pant rapidly and subsequently pass into a semiconscious state. The patient was a divorcee who had had an extremely unhappy married life and had eventually been repeatedly unfaithful to his hated wife. At the onset of his illness a friend had embezzled money from him.

In the absence of "true friends" and family he became lonely and dejected, anxious about his health and guilty concerning his sexual promiscuity.

Comment: In this instance it is likely that the fainting episodes were dependent solely upon the physiological changes brought about by hyperventilation.

Since giddiness, fainting, palpitation, and fatigue are common accompaniments of the first period of convalescence, it became pertinent to analyze the symptoms in terms of the bodily function under consideration. Convalescence may be looked upon as a period of readjustment to change of position and unaccustomed effort, as well as other more complicated personal and social changes. The following patients, though they complained relatively little, were selected for study for technical reasons. They demonstrate clearly the types of bodily changes pertinent to the aforementioned symptoms.

5. Cardiovascular and respiratory function and its relevance to giddiness during convalescence in 3 patients during recovery from acute illness.

Patient 1 was a 15-year-old boy who was studied on the fourth, fifth, sixth, and seventh days after initial mobilization following pneumococcal pneumonia. He had no complaints, but when pressed he admitted that he lacked energy, was restless and desirous of leaving the hospital. His energy improved and his restlessness increased from the third to the seventh day. In figure 17 changes are noted in blood pressure response to exercise, and the resting levels rose as time progressed. The cardiac output was elevated 18 per cent above the resting level on the first day. The fall in pulse pressure during the Flack test was marked early in convalescence but rapidly returned toward a normal response.

Patient 2 was a 21-year-old nurse who suffered a mild gastroenteritis and was in bed for three days. On the day of mobilization, minute ventila-

tion was high, although oxygen consumption was not elevated before and three minutes after exercise. The patient complained of dyspnea after exercise. The Flack test showed changes similar, though less marked, than those of the previous patient.

Patient 3 showed changes in different categories of cardiovascular function. She was a 17-year-old female who had recovered from diabetic acidosis. Blood pressure and oxygen consumption were elevated three minutes after exercise, and ventilation was elevated only after exercise. These changes progressively disappeared by the sixth day after mobilization. She complained of palpitation after exercise on the first day.

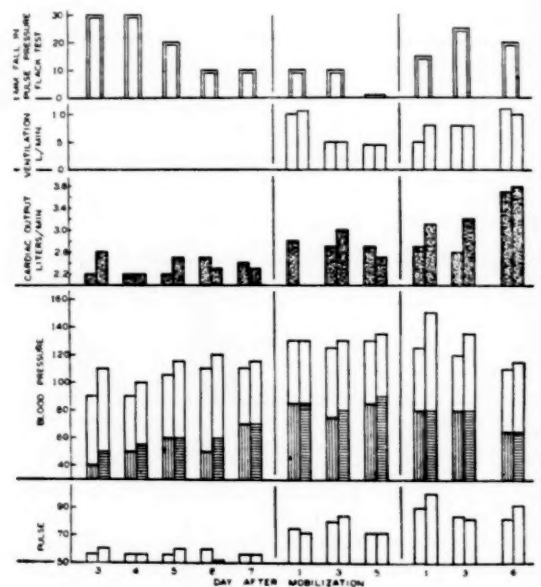


FIG. 17. Circulatory and respiratory responses to exercise in three patients during convalescence from acute illness. Note different categories of reaction in different subjects.

Comment: Although these patients were relatively free from symptoms, the qualitative circulatory and ventilatory changes appear to be relevant to the problem of giddiness and, incidentally, to palpitation, dyspnea and fatigue occurring after prolonged immobilization and analogous to those changes which we have demonstrated to occur in response to other stress-producing life situations. Deitrick, Whedon, Shorr, and Barr (18) have demonstrated in normal persons change in the tilt board fainting time during "convalescence" after prolonged immobilization. Relevant also to the problem of circulatory changes and giddiness is the work of Mayerson and Burch (43), and Allen, Taylor and Hall (6). These authors studied syncope induced by gravity on the tilt board and found

that patients with impaired exercise tolerance (prolonged elevation of the blood pressure or pulse after exercise) were more likely to faint on the tilt board than others who had normal exercise tolerance tests. In one patient the time in the tilted position necessary to produce fainting increased coincidentally with the improvement of an adverse life situation.

6. *Giddiness in a patient who feared death during the period of recovery from a myocardial infarction.*

A 45-year-old banker with a long history of being resentful, insecure and not well-liked by his co-workers suffered a coronary thrombosis. By five weeks after the original accident his temperature, pulse, WBC, and sedimentation rate had returned to normal. His electrocardiogram had stabilized. He was mobilized gradually and without warning of possible symptoms he might experience on getting out of bed. He subsequently experienced palpitation and tachycardia (he took his own pulse), light-headedness on standing and muscular weakness. He mentioned these symptoms, but again their lack of significance was not explained to him. The next day he arose, had similar symptoms, and in addition this time had marked sweating and palpitation but without precordial pain or other evidence of another infarction. Fear and anxiety had become a feature of this man's illness and were associated with symptoms which suggested to him that the function of his heart was seriously impaired. Indeed, there was little doubt that the symptoms were the result of five weeks of hospital experience.

Comment: The above is an example of an anxious man who, during an illness and in a hospital setting, became involved in a vicious cycle with progressive elaboration and intensification of symptoms. Thus, fearful of the implications of his coronary disease and ignorant of the anticipated circulatory derangements of mobilization, he over-reacted to the palpitation and giddiness which accompany the first hours of mobilization. These symptoms thus gave rise to anxiety which, in turn, as we have shown, may be associated with augmentation of cardiac output and ventilation. With such increased intensity of the symptoms, the patient became further alarmed, with further derangement of function and exacerbation of symptoms. This spiraling of events severely impeded convalescence and prolonged hospitalization.

E. FATIGUE

The term fatigue as applied to the description of a patient's complaint lacks clear definition and indeed may refer not only to sensations arising in

the body but also to the attitude of the patient toward the task to be accomplished. Thus, any of the following may be interpreted by the patient as fatigue: the aching in the muscles following intense physical exertion; the feeling that a task usually accomplished with a minimum of shortness of breath, palpitation and sense of bodily warmth calls forth more than a minimum of these sensations; the feeling of revulsion towards an unpleasant or undesirable task; the feeling of conflict in the absence of a dominant motivation or drive towards the accomplishment or performance of one's daily duties. Fatigue as it is encountered in patients is most apt to present itself during submaximal exertion and possibly explains the variability and unpredictability of results that occur in studies on submaximal exertion (19, 51, 25).

It has been indicated above that during periods of anxiety, tension and fear, the pulse, blood pressure, ventilation, stroke volume, and cardiac output have remained elevated for a longer period after exercise, indicating that under these circumstances the work of the heart and respiratory mechanism is increased, making fatigue in its overall sense more likely. Also, it has been shown that some of these changes are found in association with the fatigue of convalescence.

1. A simple experiment revealed the following: Two normal males were made to sustain a 1 Kg. weight attached by a system of pulleys to the fifth finger by flexion of that finger. The time during which the weight was sustained and the height at which it was maintained were recorded. From a total of 18 observations it was found that on the days when the subject claimed to feel "energetic" and "effective," he held up the weight longer than at other times. One subject revealed, in addition, the effect of training in that he could sustain the weight longer at the end of the experimental period than at the beginning.

It is obvious that the work done represented more than a simple fatigue phenomenon at the neuro-muscular junction. Various factors operating at the time the test was performed included the following:

- (a) The day's schedule of the subject—whether he had many or few responsibilities.
- (b) The presence of distractions, such as entertaining conversation during the test.
- (c) The occurrence of stiffness and pain due to the cramped position of the arm during the test rather than true neuro-muscular fatigue.
- (d) The feeling of exuberance or high energy as reported by the subject.

There is evidence to suggest, therefore, that when a given amount of work is undertaken under emotional stress, the exercise tolerance and, thus, the relative efficiency of the subject may be impaired. In addition, the duration of work and the amount of work which can be tolerated is dependent upon attitude, motivation and attention. Thus it is probable that true neuro-muscular fatigue rarely occurs during submaximal exertion. When fatigue is described as a symptom, one is usually referring to boredom, inattention, conflict due to lack of dominant motivation, the uncomfortable sensations due to the contraction of infrequently used muscles, or to the overall result of working in an unsatisfactory environment. There may be, in addition, slight inefficiency in function, which manifests itself to the patient in that he is unable to accomplish a given task with the same effort as previously.

2. *Inefficient cardiovascular and respiratory reactions and fatigue associated with an upper respiratory infection—"common cold."*

On October 6, 1944, subject 2 had been "exposed to a cold" and on the following day made the statement that she felt as if she were fighting off a cold. Two days later, the subject stated she had chilly sensations and stuffiness of the nose. Three days later, she developed frank coryza, post nasal drip, muscle aches, and stuffiness in the right ear. She experienced conflict between the dominant motivation to keep on working and the wish to "give up and take care of myself." On the 13th, her symptoms subsided rapidly, and on the 16th she had no complaints.

The changes in the pulse, blood pressure and cardiac output are shown on figure 18 during the course of this minor illness. It will be seen that the pulse, blood pressure and cardiac output were elevated to a greater level than usual after exercise, during the period of her illness.

Comment: The subject had the poorly-defined symptoms which accompany a "cold," such as loss of energy and difficulty in performing usually easy tasks. It would appear that the primary defect was reflected in the cardiovascular system when it was subjected to exercise. This chain of circumstances may be related to the common clinical experience of decompensation in diseased hearts occurring at the time of some minor infection, such as a "cold." The emotional response to the situation of the "common cold" is variable. It includes resentment, conflict over the desire to keep on working and the desire to rest and "treat the cold," fear that the upper respiratory symptoms might be the prodromal state of some more serious disease, and

fear of the commonly publicized sequelae of complications of a cold. Therefore, the total response of the individual to infection by the virus of the "common cold" includes emotional and associated cardiovascular reactions.

3. *Diminished exercise tolerance with fatigue during an infectious gastroenteritis.*

Subject 2's immediate family all had had attacks of nausea, vomiting and diarrhea, associated with fever. She had cared for them during their illnesses. The day after the last one had recovered, the subject herself noted watery diarrhea, abdominal cramps, anorexia, and nausea. The dominant mood reaction was one of defiance. The sub-

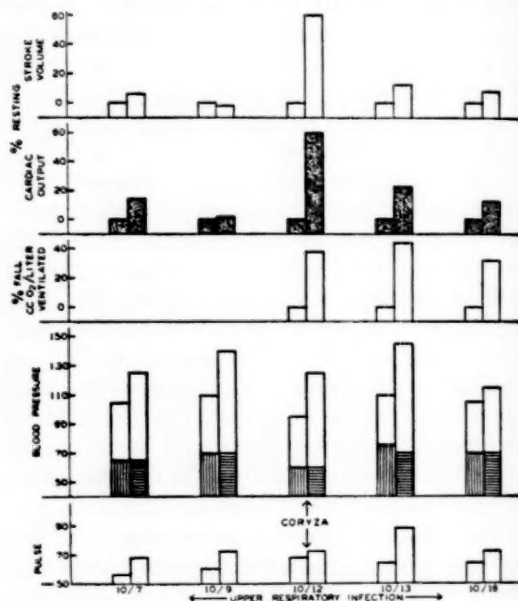


Fig. 18. Inefficient circulatory function (stroke volume) associated with fatigue during an upper respiratory infection. 10/7 and 10/16 are considered optimal days.

ject had made up her mind that she would surmount the disability and perform her duties. She was exhausted and could hardly finish the day. She stated that she had performed her work adequately but that she felt that it had required more drive. She said that this behavior was "worth the price" because it sustained her system of security. Her temperature was 37.4° C. by mouth at the time of the experiment. The pressor effect after exercise is shown in figure 19. The other functions were not involved.

Comment: The factors of systemic infection, dehydration and lack of food, together with her defiance of the illness, constituted the situation which was reflected in a slow return of the blood pressure to resting levels after exercise and associated fatigue

4. Diminished exercise tolerance with fatigue following a sleepless night.

Subject 2 spent the evening visiting night clubs with an old friend. She consumed only a small amount of alcohol but danced many hours and had only three hours' sleep before coming to work. She performed adequately at work but complained of feeling fatigued, very warm, dry eyed, and lacking in energy. Figure 20 demonstrates the cardiovascular and respiratory function on that day.

Comment: The reaction to an exhausting but pleasant evening with very little sleep included profound changes in cardiovascular function.

From the standpoint of application of these principles to patients, when searching for the cause

full day's work was indulged in. Monday found the subject rested but having some difficulty attempting to get back into "the swing of things." The daily incidence of blood pressure readings

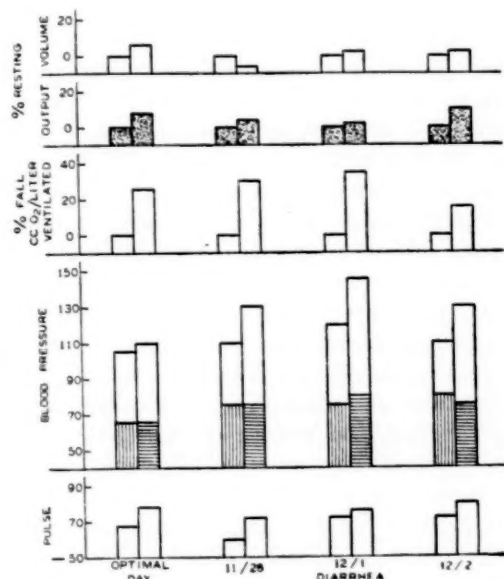


FIG. 19. Inefficient circulatory (blood pressure) and respiratory function associated with fatigue during an infectious enteritis.

of fatigue, one should explore the attitude and motivation of the individual toward the task in which the fatigue develops. Furthermore, removal of the patient from the stress-producing situation in which the fatigue occurs reduces such fatigue.

5. Variation in blood pressure response to exercise on the different days of the week.

Subject 1 had a very highly organized work schedule for the week. Although the duties undertaken on the different days of the week varied, essentially the same activities were engaged in every Monday, every Tuesday and so on through the other days of the week. The greatest of responsibilities was present during the latter half of the week when teaching, clinic and other demands were greatest. Saturday was less pressing, but a

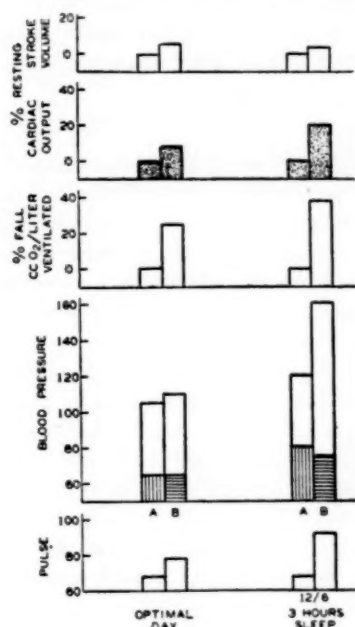


FIG. 20. Inefficient circulatory (blood pressure and pulse rate) and respiratory function associated with fatigue following a sleepless night.

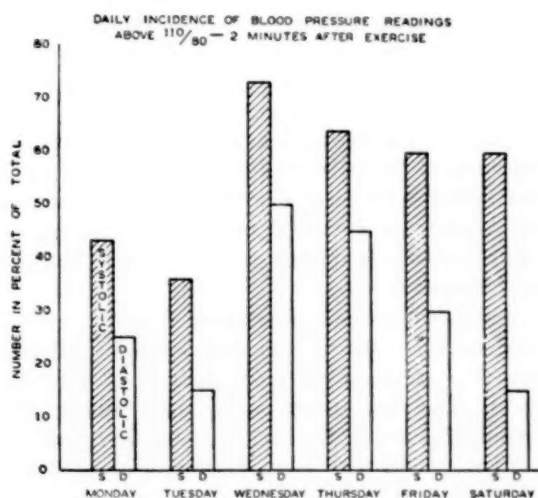


FIG. 21. Per cent of blood pressure readings elevated after exercise plotted on the days of the week. Note the change in pattern as the end of the week and increasing responsibilities were approached.

above 110/80 two minutes after exercise was plotted for all the days of the week during each half of the total period of observation. The two curves were found to superimpose with accuracy, and the resultant of the two curves is plotted in figure 21.

Comment: It has been shown that the day-to-day variations in the adverse situations experienced in every day life, if they have a definite pattern, may reflect themselves in the individual's ability to tolerate exercise. In addition, these bodily reactions contribute to the fatigue which usually appears during the latter half of the work week.

GENERAL COMMENT

Statements in the literature concerning the "effect of anxiety on bodily functions" are common. Unfortunately, such references focus attention upon the emotional aspects of the response to a situation rather than upon the effect of the situation on the entire organism. It is the latter concept which is of importance to the physician.

Familiar responses of the cardiovascular system to stress-producing situations include a change in the heart rate (70, 71), rise in blood pressure (2, 3, 49, 65), change in the contractile state of the blood vessels of the skin (45, 46), increase in the cardiac output (30, 60), alteration in the respiratory rate and depth, and, more specifically, increased ventilation in response to painful stimuli without increase in the oxygen consumption (4, 10, 11, 14, 22, 23, 34). In terms of the methods employed, the aforementioned studies were of two types. The larger group consisted of observations and attempted correlation of the physical manifestation, and emotional and other feeling reactions in psychologically maladjusted patients. The smaller group consisted of descriptions of the reactions to laboratory situations designed to arouse anxiety or other emotional responses. The orientation in this study is that the reactions of the individual in and to his every day environment are more relevant to disease than are his responses to a startling noise, a sudden frightening experience or during an affective state induced by hypnosis.

Previous, accurate, experimental studies of the cardiovascular system have been made on subjects who are far removed from their usual environment. The rigid definition and utilization of the so-called basal state has been attended by reproducibility of results with methods of extreme accuracy. This situation is obviously ideal to assess the effect of a single drug or simple stimulus on an organism which is removed from other stimuli. However, little attention has been paid to the effect of diffuse and complicated environmental stimuli on the organism (7, 12, 67).

The method of following the subject from day to day for a long period of time and noting his attitude, amount of talk, the speed, grace and

amount of body movement, gestures, posture, general behavior, facial expression, sleep, dreams, his statements as to situational factors, his affective state, and his cardiorespiratory functions indicated that situational factors cause drastic changes in cardiorespiratory functions. It has been shown that these contribute to the causation of symptoms in patients and that they constitute a factor in the precipitation of crises, such as cardiac failure, in the cardiovascular or respiratory systems.

The question might arise as to whether feelings of which the individual was not fully aware might explain the apparent lack of association in some instances between emotions and cardiorespiratory changes. Despite the fact that the data in this study includes observations upon performance and behavior, as well as the interpretation of dreams, and thus includes information concerning the affect possibly not recognized or reported by the subject, it was impossible for the examiners to appraise the dominant affect or the psychodynamics in many instances.

Situations which constitute every day life, although they may produce a predictable response in a given subject, are essentially non-specific. Unless the past experience (previous conditioning) of the subject is known, there is no way of foretelling the character of the emotional and physical responses to a situation. Indeed, it has been observed that the intensity and duration of the responses depend upon the past conditioning of the subject and, in addition, upon the pressure of responsibilities present at the time the situation occurs.

It has been shown that specific associations between a given emotional response and the physical response to a situation do not always occur. However, to a certain extent the hyperdynamic reaction was associated with rage, fear, anger, resentment, and anxiety. On the other hand, the hypodynamic reaction suggesting a failure to strike back against an assault was associated with feelings of hopelessness and defeat.

SUMMARY

Day-to-day studies were made over a period of almost a year of the symptoms and cardiovascular and respiratory functions of healthy human subjects, and short term observations were made on selected patients.

Emphasis was placed upon the reactions to persistent low-grade stresses and strains which are a part of "every day" living and which constitute the core of the bedside problem rather than upon the

well-known responses to major life crises. These studies have revealed the following:

1. Dyspnea associated with inefficient pulmonary ventilation may occur in response to stress-producing life situations in association with anxiety, anger, guilt, rage, frustration, and tension.

2. Palpitation associated with increased stroke volume may occur under similar circumstances.

3. Heart pain in the presence of anatomical narrowing of the coronary arteries may result from increased work of the heart attendant upon prolonged elevation of the blood pressure and cardiac output in association with rage, resentment, anxiety, fear, and tension.

4. Heart pain in the presence of anatomical narrowing of the arteries may result from a fall in the cardiac output and coronary blood flow in association with desperation and defeat.

5. Giddiness and faintness may result from cerebral anoxia attendant upon diminished venous return to the heart. Also, giddiness and faintness may result from hyperventilation, which is followed by cerebral vasoconstriction, impaired dissociation of oxyhemoglobin and cerebral anoxia. Both types of cerebral anoxia occur in response to stress-producing life situations in association with feelings of exhaustion, anxiety, fear, and during the early part of convalescence.

6. Fatigue as experienced by patients is a complex state dependent upon emotional attitude, the absence of a dominant motivation and the presence of a stress-producing life situation with accompanying inefficiency of cardiovascular and respiratory function.

7. Individuals differ as regards the intensity and duration of the cardiovascular and respiratory responses to life situations. The fact that a single subject tends to react under different circumstances in many different ways suggests that the individual is manifesting a variety of ways of dealing with his environment as regards his cardiovascular and respiratory functions.

8. These results indicate that, in a setting of adverse life circumstances and associated emotional reactions, performance in terms of respiration and work of the heart is costly. This high cost may manifest itself in cardiovascular symptoms which are not dependent alone upon gross structural heart disorder. This uneconomical performance may also manifest itself in impaired total efficiency of the individual.

The authors are grateful to Miss Helen Goodell for valuable assistance in all phases of this work.

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SUMMARY OF DISCUSSION BY THE CHAIRMAN,
DR. EDWARD WEISS

We had planned this meeting of the Committee on Cardiovascular Diseases of the American Society for Research in Psychosomatic Problems to discuss "Fundamental Problems in the Psychosomatic Approach to Cardiovascular Disease."

Therefore this paper by Dr. Harold Wolff and Dr. George A. Wolf, Jr., is particularly appropriate for our purposes. It represents a day-to-day study of normal individuals and patients with cardiovascular disease and shows that when an individual is burdened by emotional stress his cardiovascular system over-reacts to a standard exercise test as determined by certain cardiovascular and respiratory measurements. By discussing with the individual at the time the measurements were made the important aspects of their day's work, the dominant mood and preoccupations, and any dreams that they could remember, an effort was made to see if a relationship exists between bodily reactions and concurrent feelings.

Important points in discussion concerned the emotionally conditioned patient (Hoskins); the attitude of the patient toward the test procedure and how that may influence results; and the ques-

tion of a chain reaction regarding emotions and their physiological responses (Fremont-Smith)—what might be referred to as the vicious circle created by anxiety.

Much of the discussion had to do with the question of conscious feelings and emotions (affects) of which the patient was unaware. Many of the group felt that unconscious factors essential to an understanding of the problem were not sufficiently revealed by the psychological technics employed in the study. Others (Saul) suggested that the important point of the study was the demonstration of this particular biological reaction with an indication of the main psychological forces at work. A point was raised regarding similar physiological responses to different affective states (Katz). A suggestion was made (Steele) that group study was important in this kind of investigation and there were many who felt that in this way studies of the unconscious mental life could be correlated with physiological responses. Hypnosis was suggested as a psychological technic for such studies (Fremont-Smith).

Differences in terminology in two universes of discourse (Hoskins) were recognized as one of the difficulties in this kind of an investigation, and trying to apply the same measurements to different phenomena (Cohn) was mentioned as one of the stumbling blocks to team investigation.

The chairman spoke in favor of group study and said that we were not so much interested in proving psychogenesis as we were in simply studying a problem by means of the psychosomatic approach, which means not to study the soma less but only to study the psyche more, in other words, careful combined studies by physiological methods and psychological technics. Reliable methods are available in both fields of investigation.

We hope that this excellent study will inspire others to make further investigations and to report them at future meetings of this group.

PSYCHOSOMATIC RESEARCH FUNDS AVAILABLE

The Psychosomatic Research Fund of the National Committee for Mental Hygiene announces that funds are available for projects dealing with the psychosomatic study of cardiovascular disease, including essential hypertension.

Communications should be addressed to:

Dr. Edward Weiss, Director
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HORMONAL MODIFICATION OF SOCIAL BEHAVIOR

II. THE EFFECTS OF SEX-HORMONE ADMINISTRATION ON THE SOCIAL DOMINANCE STATUS OF THE FEMALE-CASTRATE CHIMPANZEE

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Alterations in hormone level, in addition to producing changes in the morphology and physiology of an organism, are capable of yielding predictable modifications in the behavior patterns which characterize the responses of an animal to a wide variety of situations. One of the aspects of behavior which may be decisively reorganized by shifting of the hormone balance typical of a given species, particularly by changes in the estrogen-androgen equilibrium, is social interaction. Of the many-sided phenomena of social behavior, the phase to which the bulk of experimental attention has been directed in psychosomatic study is the mating act. This concentration of attention, though productive of much valuable knowledge, has led to the confusion of the mating act *per se* with certain more pervasive and continuous forms of inter-individual relations, of which systems of dominance and subordination behavior are typical examples. Especially has this limitation been characteristic of primate research, from which broad generalizations to the human social level have been recklessly made on the basis of evidence which on the whole can most charitably be described as provisional.

It is a well established fact that changes in the phase of the sexual cycle in the female infrahuman primate are concomitant with alterations in social dominance status. In general the literature on primate species lower in the scale than the anthropoid apes indicates (15, 17, 18, 19, 35) that the female at the height of her "femaleness," *i.e.*, at the stage of maximum sexual receptivity or "heat" in her cycle, becomes more socially subordinate than at any other time. This evidence, based as it is on both systematic investigation and general observation, and cohering as it does with the evidence obtained on vertebrate forms lower in the phylogenetic scale, has been taken as contributive substantiation of the general concept of dominance as a masculine, and subordination as a feminine pattern. The female chimpanzee seems to represent an exception among the vertebrates to the rule that rise in estrogen level is accompanied by a drop in dominance status. Whereas in all other primate species studied estrogen level bears an *inverse* rela-

tion to social dominance level, in the intact female chimpanzee the relationship between the hormonal condition and the behavioral state is roughly that of a direct proportion and, as Crawford and Yerkes have shown, the autogenous rise in estrogen level in the course of the normal sex cycle is accompanied by a characteristic *increase in the dominance status of the female* (8, 25, 26, 27). These data throw into question the validity of the masculine-dominance, feminine-subordination concept as applied to primates as a whole, and pose the problem of the investigation of the mechanism of hormonal effects on chimpanzee social dominance as an urgent need for the science of comparative social behavior.

In a previous paper (6) the writers have shown that treatment of the *male*-castrate chimpanzee with female sex-hormone is productive of behavioral changes quite at variance with those elicited by the autogenous fluctuation of sex-hormone level in the *intact female* of the species. The elevation of the estrogen level in the male-castrate by means of the oral administration of alpha-estradiol, instead of enhancing his dominance status, produced a decrement in it as measured by a food-competition test and by general observation, whereas raising his male sex-hormone level through the administration of regular quantities of methyl testosterone yielded a significant enhancement in his dominance status. These results, which are more in accord with the information obtained in the investigation of other vertebrate forms and with the general clinical evidence than with the reported data on chimpanzee females, raised certain fundamental questions as to the nature of the mechanisms which underlie endocrine-social effects in general, and as to the basis for such a marked sex-difference in hormonal effectiveness within a given primate species in particular. The first point which arose for consideration was the possibility that the obtained difference in sex-hormone effects between the normal female and the male-castrate was an artifact either of castration or of method in hormonal administration rather than a valid sex-difference in the behavioral effectiveness of estrogens. This question was unanswerable on the basis of previously existent evidence, because investigation on female chimpanzee dominance had been confined solely to the observa-

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tion of behavioral changes associated with normal fluctuation in the intact female, and comparative data on female castrates was entirely lacking. Thus the first purpose of the present investigation was to obtain data on the effects of male and female sex-hormone therapy on the social behavior of the female castrate chimpanzee for comparison with the data previously acquired in connection with the study of the male-castrate. This body of data, it was felt, would make possible not only a comparison of estrogen effects upon the male and female under comparable conditions, but would also provide evidence on the nature of the effects produced by male sex-hormone therapy in the female chimpanzee. Second, it would make possible a comparison of the relative effectiveness of male and female sex-hormones in increasing social-dominance in the female.

The current study was further designed to provide information on the persistence of hormonally induced modifications of social behavior. The writers (6) found that for the male-castrate chimpanzee the effects of modification of hormone level were of long duration, and persisted for a considerable period after complete cessation of therapy (*i.e.*, to a point well beyond the time required for the elimination by the animal of any detectable residual quantities of sex-hormone). These results contrast sharply with the characteristic effects of increase in estrogen level in the cyclical female, whose period of dominance is quite sharply terminated with the disappearance of the peri-anal tumescence which accompanies the periodic rise in estrogen level.¹ If this difference in the degree of persistence of effect is found to exist in the comparison between the male and female castrates as well as between the castrate males and the intact female, certain lines for the examination of a possible differential neural and/or peripheral basis for

the hormonal effects on behavior in male and female chimpanzees will have been opened up.

The present study, therefore, is the report of a series of investigations on the effects of both male and female sex-hormones on the social behavior of the castrate female chimpanzee, and is designed to provide evidence of a comparative nature for the clarification of the problem of the mechanism of hormonal influences on social interaction in infra-human primates.

SUBJECTS AND PROCEDURE

The animals used in the present study were three post-pubertally ovariectomized and hysterectomized female chimpanzees. They had been living together as cage-mates intermittently for several years prior to the time of the experiment, but had not been together for the six month period immediately preceding the work reported here. Upon initial testing, the animals showed a stable, linear dominance-subordination hierarchy, in which the order of domination was: Lia, Nira, May, with Lia dominant over both the other subjects, and May subordinate to both Lia and Nira.

The experimental design consisted in the maintenance of normal conditions for Lia, while the sex-hormone level of the other two animals was systematically varied by means of either oral administration or the implantation of pellets of male and female sex-hormone.² The hormones were taken orally by Nira, but May, who refused to take the drugs orally, was treated by means of the implantation of endocrine pellets. In Table I of the results, an outline of the experimental sequence, dosages and dates of experimentation is presented.

The test procedure was the same as that used by the writers in an earlier study on the effects of sex-hormone administration on the social behavior of a male-castrate chimpanzee (6). Since the test method and its antecedents (22) are discussed in detail in the earlier paper, only the essential outlines of the method will be presented here. The animals were tested for dominance-subordination status under different conditions of hormonal level. A minimum of four testing periods occurred under each of the two conditions of sex-hormone administration. A test period consisted of *twenty critical trials*, *i.e.*, trials in which a cup containing a peanut was placed at a point midway between the competing animals. Each critical trial was alternated with a *free trial*, *i.e.*, a trial in which both animals

¹ Since the fact of genital swelling will be referred to frequently in the course of this paper, it is desirable to present a résumé of events as they are related to shifts in estrogen equilibrium. If we start with the phenomenon of bleeding, there are six stages in sex-skin condition which are externally distinguishable. Yerkes (28, p. 46) has summarized these as follows: "1) Menstrual bleeding; 2) post-menstrual unswollen period; 3) a period of swelling or tumescence; 4) a phase of maximal genital swelling; 5) a period of detumescence during which the swelling disappears; and 6) a pre-menstrual phase with slight, if any, swelling." This account of events is of course schematic and more detailed descriptions are available in the general literature (9, 29, 30, 31). Allen *et al* (1) have shown that the estrogen level is highest at maximum swelling, and lowest at menstruation. The state of the genital area during the pre-menstrual period during which little or no swelling occurs is generally referred to as P-R, or the permanent-residual state of the sex-skin.

² Alpha estradiol (Progynon-DH) and methyl testosterone (Oreton-M) were generously supplied by the Schering Corporation, Bloomfield, N. J.

received rewards. The free trials were such that the competitors were simultaneously pre-rewarded. Simultaneous pre-rewarding was accomplished by means of a board fifty inches long, to the ends of which two food cups were attached. A peanut was placed in each cup and the board brought up to the wire mesh of the cage. Thus each competitor obtained a *free nut* before each test, or critical, trial.

wards. At least four sets of tests were run for each condition of hormone administration.

Under conditions of estrogen administration tests were conducted when the treated animal achieved and maintained the maximum-tense condition of genital swelling. The tests during the period of androgen administration were begun one week after the initiation of treatment. In all control series

TABLE I

Hormonal condition	Dates	Competition scores		Difference scores
		Lia	Nira	
Period 1, non-hormone, control	5/31	17	3	14
	6/4	20	0	20
	6/7	19	1	18
	6/11	20	0	20
				Mean: 18.3
Period 2, Nira given alpha estradiol 2 mg./day	6/21	13	7	-6
	6/23	3	17	14
	6/25	2	18	16
	6/26	6	14	8
				Mean: 8
Period 3, inter-hormone, control	7/8	20	0	20
	7/9	19	1	18
	7/10	19	1	18
	7/12	20	0	20
				Mean: 19
Period 4, Nira given methyl-testosterone 50 mg./day	7/21	14	6	8
	7/22	10	10	0
	7/23	16	4	12
	7/24	5	15	-10
				Mean: 2.5
Extra test session	8/2	12	8	4
Period 5, post-testosterone control	8/13	16	4	12
	8/14	15	5	10
	8/15	14	6	8
	8/20	19	1	18
	8/23	17	3	14
	8/30	18	2	16
	9/1	19	1	18
	9/2	19	1	18
	9/3	19	1	18

The use of alternate pre-reward trials prevented excessive frustration for the subordinate, and provided control data on the food-motivational state of the animals. The critical trials were presented by replacing the double-cup board by a single cup, into which, in full view of the animals, a single peanut, the *test nut*, had been dropped. On any test day, ten test-trials alternated with free trials were given in close succession, and were followed by a rest interval of from five to fifteen minutes, after which a second series of ten trials was run. Thus, each test session consisted of a total of twenty test-trials alternated with twenty pre-re-

both competing animals were in the permanent residual state of sexual-swelling.

RESULTS

The principal data which will be considered in discussing the effects of sex-hormone level upon the dominance status of the female-castrate chimpanzee are derived from the series of tests in which Nira and Lia were in competition (Study I). This evidence is presented in Table I. The results obtained in the tests of May *versus* Lia, and May *versus* Nira (Study 2), will be dealt with in connection with the limited aspect of the problem involving the

adequacy or inadequacy of the "granting of privilege" concept (25, 26) as a basic factor in the improvement of female chimpanzee dominance status upon rise in the level of estrogen concentration. These ancillary data are presented in the text.

Period 1, the Pre-Treatment Control Series: In the four test sessions of the pre-treatment series, Lia clearly demonstrated her dominance over Nira. Of the eighty test-nuts presented in the course of these trials, Nira obtained only four, or a grand total of 5% of the nuts, whereas Lia obtained seventy-five of the test-nuts, or 95% of the nuts. The *t* value (cf. Table II) when used as the test of significance of difference (11) reveals that the probability of the obtained difference in score being due to chance variation alone is less than one in one-thousand, and that the difference is statistically a reliable one.

The only occasions on which Nira obtained any nuts in the competitive situation occurred in the

Further, with the beginning of the second set of trials, the subordinate animal developed the practice of turning her back to and peering over her shoulder at the nut and presentation cup on the competitive trials. That the turning away from the competitive situation was not produced simply by her lack of food motivation was indicated by the fact that on non-competitive presentation she readily took and ate the freely presented nuts. Since these free nuts were alternated with the test-nuts, it is highly unlikely that lack of food motivation was the basic factor underlying the behavior. The tendency to withdraw from a frustrating situation by literally "turning one's back upon it" was not unique to Nira, but occurred, too, in the case of the subordinate member of a pair of competing male chimpanzees, as was reported in a previous paper. In observing chimpanzee behavior, one is constantly struck by the manner in which tension-reducing mechanisms which occur symbolically in the human being are reproduced in literal form in the chimpanzee.

Period 2, the Female Sex-Hormone Series: Tests between Lia and Nira were begun on the day following Nira's achievement of the maximal-tense condition of the sex skin. An examination of the scores for the test-series as a whole indicates that Nira had priority of response over Lia in the food competition situation during all of the test sessions except the first. At no point was Nira's dominance absolute, since Lia obtained some of the nuts in every competition series. However, there was never any doubt from the second test-session onward that Nira had become the dominant member of the pair.

When the scores for the experimental period as a whole are examined statistically, it is found that the *t*-value (Table II) for the significance of the obtained difference in test-scores for Lia *vs.* Nira is 1.70, a value which indicates that the obtained difference is no greater than might be expected on the basis of the operation of factors of chance variation. Thus, if the statistical analysis of the significance of the difference is alone taken under consideration, it would be valid to state that the administration of female sex-hormone had increased Nira's dominance status to the point where she was no longer subordinate to Lia, and as a matter of fact had reached a position of statistically unreliable superiority in score to Lia in the food competition situation. The validity of these inferences is substantiated by a comparison of Nira's scores in the testing period with her scores in the non-hormone-administering control period. The *t*-value of 4.30 obtained in this comparison (Table

TABLE II
TABLE OF T-VALUES

Comparisons	<i>t</i> values	P † (levels of confidence)
Nira 1 <i>vs.</i> Lia 1 *	12.90	.001
Nira 2 <i>vs.</i> Lia 2	1.70	.40 (approx.)
Nira 3 <i>vs.</i> Lia 3	32.59	.001
Nira 4 <i>vs.</i> Lia 4	0.52	.50 (approx.)
Nira 1 <i>vs.</i> Nira 2	4.30	.03

* Numbers refer to the experimental periods.

† The level of confidence or *P* in each case is based on Fisher's (11) table of *t* when the degrees of freedom are taken as 3. It is to be noted that our reliabilities of difference are based on the conservative use of test sessions as a whole, and not upon individual trials in each session. The .05 level is the conventional upper limit of reliability.

first and third sets of test trials. In the first set of tests, Nira took the first three nuts. However, as the trials progressed, Lia rapidly became the dominant animal, and thereafter never relinquished her position of dominance. The position of dominance was achieved without any fighting. At first Lia was somewhat cautious in reaching for a test-nut when Nira's mouth was near the presentation cup, but after a few successful trials she gained confidence and reached without hesitation regardless of Nira's position in relation to the cup.

Nira, the subordinate animal in the pair, presented certain features of behavior which, at least tentatively, are highly suggestive of some human modes of adjustment to frustrating situations. At one point in the first set of twenty trials, she reached her hand for the test-nut but was forestalled by Lia, who reached ahead and took the nut out from under Nira's hand. Nira, instead of protesting or withdrawing her hand, continued her movement, carried her hand up to her face and scratched.

II) is significant to at least the 3% level of confidence, and is a measure of reliability of difference which indicates that Nira had achieved an increase in dominance status under female sex-hormone therapy.

The qualitative evidence, however, leads one to eschew the narrow boundaries imposed by the statistical analysis, and to posit that not only had the estrogen therapy increased Nira's dominance to the point where she no longer played the subordinate rôle in her relation to Lia, but that a true reversal in dominance status had occurred when the initially subordinate member of the pair was treated with female sex-hormone. The data which we feel warrant such an excursion beyond the quantitatively demonstrable are as follows: In the first ten trials of test session 1, Nira, although she appeared to be far less hesitant than in the non-hormone test series and did not turn her back toward or in any way avoid the test situation, remained in the position of subordinate and took only one test-nut toward the end of the set of ten trials. The second set of ten trials, which followed after a five-minute intermission, witnessed the beginning of a shift in dominance status. Each animal watched the other carefully, and Nira, behaving with ever increasing assurance, took six of the test-nuts to Lia's four. At no point did Lia make any attempt to assert herself, and Nira seemed to adopt the priority of response as her right. Thereafter, in all subsequent sessions of testing in the period during which female sex-hormone was given her, Nira maintained her hormonally induced position of dominance. Nira's confidence grew in proportion as Lia became more hesitant, and by the third set of test-trials Nira had become so confident that when Lia made a tentative reach for a test-nut, Nira calmly reached ahead of Lia's hand and took the nut. This behavioral evidence strongly suggests that a true reversal of dominance-subordination status occurred as a result of the administration of estrogen to the initially subordinate female in the pair, and that the inconsistent score obtained in the first test-session was the product of previously established habits of subordination-response which had to be unlearned by Nira. Once the obstacle of prior subordination-experience was overcome, there was never any departure by Nira from her position of dominance. On the basis of such reasoning in terms of the qualitative data, the prediction was that a statistical analysis of the last three test sessions would reveal the reliability of Nira's dominance scores. Such an analysis confirmed the hypothesis, and the obtained t -value of 6.35 for the

difference indicates its reliability to the 3% level of confidence.

Period 3, The Inter-Hormonal Control Series: The testing of the animals was begun twelve days after the daily administration of Progynon-DH had been discontinued, and Nira's sex-skin had been in the permanent residual condition for a week. An analysis of the scores for this period as a whole shows that with discontinuance of the hormone administration to her competitor, Lia once again became the dominant member of the pair. The t -value of 32.59 (Table II) indicates that Lia's obtained superiority in test score is reliable to the .001 level of confidence. The general behavior of the animals in the test situation, too, was such that it was clear that Lia had once again achieved the status of dominant animal. In all of the trials of this series Nira's food motivation was quite high, and on several occasions she made hesitant, tentative reaches for the test nut. However, on only two occasions in the entire set of eighty trials did she succeed in getting the competition nut. On one of these occasions she was successful by virtue of the fact that Lia turned away from the testing situation at the moment of food presentation, and so was at a marked positional disadvantage. On the remaining occasion, Nira hastily placed her hand over the presentation cup, but did not take the test-nut until she had looked at Lia. Upon Lia's failure to interfere, or make any sign of protest, Nira took the food from the cup and ate. On all other trials, however, Lia clearly maintained priority of response. Thus, it was clear that cessation of the female sex-hormone therapy caused the original dominance-subordination relationship to be reestablished, with Nira resuming her rôle of subordinate animal, and Lia behaving as the unchallenged dominant.

Period 4, The Male Sex-Hormone Series: Tests were begun on the eighth day after the instigation of the administration to Nira of male sex-hormone (Methyl-testosterone 50 mg./day). Under treatment with the male sex-hormone, Nira's behavior changed to the point where she no longer was clearly subordinate to Lia. The scores for the period as a whole indicate that a condition of equivocal dominance-subordination was achieved, with neither of the animals reliably dominant to or subordinate to the other. The obtained t -value for the significance of the difference in mean test scores of .517 is reliable only to approximately the 60% level of confidence and indicates that the difference in test scores is no greater than that which could be produced by chance variation alone.

As was the case in all the preceding periods, there

were no indications of active combat nor any frustration responses of a violent sort attendant upon change in relative social status. Usually both animals reached for the test-nut simultaneously, and the one whose hand reached the food container first always took the nut. The seeming resurgence of Lia's dominance on the third set of trials (score: Lia 16; Nira 4) needs to be considered in terms of the existence of this "first come, first served" pattern of behavior. On the third set of trials Lia worked very rapidly, and no sooner was the test-nut presented than she reached for it. As a result, on almost all the trials of the session she anticipated Nira, who was working more slowly, and on sixteen of the twenty trials Lia was the animal whose hand first reached the food cup. In an equivocal dominance-subordination situation, such as the one which obtained for our animals in the current condition of hormone administration, an improvement in the efficiency of response is sufficient to give an advantage to the speedier worker. It is this increase in efficiency by Lia which is reflected in the data as a seeming resurgence of dominance. The facsimile character of this resurgence is indicated by the general behavior of the animals in the test situation and by the fact that in the very next set of trials on the following day Nira, too, increased her tempo of work and succeeded in getting fifteen of the nuts to Lia's five.

Thus the results of the administration of methyl-testosterone to the subordinate member of our pair of female-castrate chimpanzees indicates that a reliable improvement, but not to the level of a reversal in dominance status, is achieved through the medium of male sex-hormone therapy. An attempt was made to induce a reversal in dominance-subordination by continuing methyl-testosterone administration for another week, but without apparent effect. Upon testing after a further week of treatment the relationship was still of an equivocal character, with neither animal clearly dominant or subordinate to the other.

Period 5, The Post-Testosterone Control Series: Tests were resumed two weeks after cessation of methyl-testosterone administration, and it was found that although Lia had once again become the dominant member of the pair, she had not yet achieved the degree of dominance characteristic of the previous control periods. There seemed to be a residual effect of the testosterone treatment, which continued for more than three weeks after cessation of testosterone dosage (Table I).

Control Tests on the Applicability of the "Granting of Privilege" Concept Involving a Third Female-Castrate: The object of the following series

of observations was to determine the relevance of the "granting of privilege" concept to the shifts in dominance status which occur when the normally subordinate member of a pair of female chimpanzees is in the condition of sexual receptivity. The privilege-granting idea, most fully developed by Yerkes (26, 27), represents an extension of the prostitution hypothesis advanced by Kempf (15) as an explanatory device in connection with his observations on the social and sexual behavior of infra-human primates. The concept in modified form (*i.e.*, with "sexual" presentation interpreted as being an admission of social inferiority rather than as an offer of sexual favors) has been used too, by Zuckerman (35) and Maslow (18), as the basis for the interpretation of certain social phenomena observed in the course of their studies of primate social behavior. In its essence, the concept of privilege-granting is an attempt to explain the improved social-dominance status of the estrus female when paired with a customarily dominant male as a product of a granting of certain privileges by the male in return for (or in anticipation of) the receipt of sexual favors. The facility with which analogies to the situation which obtains in prostitution at the human level can be made is obvious, and recently one important popular-science writer has discussed the concept as though it had attained the level of an experimentally verified fact (23).

As we have already pointed out elsewhere (6), the concept is superfluous in dealing with dominance shifts in male pairs, and the direct utilization of the granting of privilege concept as an explanatory device in the discussion of the shifts in dominance-subordination status which accompany alterations in the sex-cycle of pairs of female chimpanzees is impossible, unless one makes the assumption that privilege-granting is socially conditioned among the females on the basis of their previous experiences in adult heterosexual groups.³ Although the possibility of such social conditioning of response is highly improbable, it cannot be dismissed on *a priori* grounds alone when one is dealing with an animal having the wide range of social capacities possessed by the chimpanzee. Therefore, we felt that although in our pairs of male and female castrates we had observed no behavior which could even remotely be interpreted as privilege-granting, if we were to discuss the modification of

³ That the male chimpanzee may have a directly determined, unlearned reaction of inhibition of aggressive tendencies to the stimuli provided by the female in swelling is a theoretical possibility. But, that a similar unlearned inhibitory response is present in the female seems to us too improbable to warrant serious consideration.

behavior under the conditions of estrogen administration as an instance of a true increase in dominance for the treated female-castrate all possibility of privilege-granting would have to be eliminated.

It is important to realize that in the "granting of privilege" concept was the report of an impression, and not the statement of a testable hypothesis. Therefore to test the applicability of the concept to a given body of evidence, it is essential that the behavior and the assumptions involved in the concept be delimited. Privilege-granting represents the interpretation of two concurrent changes in behavior: *First*, that as the subordinate female achieved the maximal-tense condition of sexual swelling and became sexually receptive, the dominant animal tended to withdraw from competition and permit the sexually receptive animal to take food without contesting her right to do so. *Second*, that the subordinate female, when she came into full sexual swelling, became less timid and took food as though it were her right. These are the facts of behavior. To these facts there was added the following *assumption* to produce the "granting of privilege" concept. It was assumed that the tendency of the dominant animal to withdraw from contest when the subordinate animal became sexually receptive was the reaction of the dominant animal to the new feature of receptivity in the subordinate female, either through the perception of the swelling itself, or through the perception of behavioral changes.

Once this delineation of the factors which underlie the concept is made, it becomes converted into an hypothesis which is capable of being tested in the arena of female-female relationships. This testing was done by means of making the alternative assumption that the withdrawal from contest by the initially dominant female when her subordinate partner entered maximum sexual swelling was due to the perception of an increase in aggressiveness or in irritability in the subordinate by the dominant animal. Thus, the solution of the question depends upon the differentiation of these two stimulus-complexes in terms of the manner in which they effected the behavior of the dominant animal. Was it the perception of sexual receptivity (increased submissiveness), or the perception of increased aggressiveness and irritability in the subordinate which induced the changes in behavior in the initially dominant animal? An examination of the behavior changes induced in the dominant animal provides the answer to this question.

When Nira came into maximum-swelling, and became the dominant member of the Lia-Nira pair, at no time did Lia give way "willingly." The im-

pression created by the behavior of the animals was that Lia would have taken the test-nuts had she dared, but withdrew from contest in the face of Nira's increased aggressiveness. Behavioral evidence for this statement is available in our description of the test results under estrogen therapy. Further, Lia's behavior toward Nira (*i.e.*, increase in hesitancy) was not qualitatively different when Nira was under androgen therapy from what it was when the estrogens were administered.

A second set of experiments in which May, a subordinate female castrate, was paired with Nira and with Lia provided other relevant data.

In pre-hormone tests May was completely dominated by both Lia and Nira and, except for a few on the first set of twenty trials, did not obtain a single test-nut when in competition with each of the other animals during four test periods. The scores for the entire period were: Lia 72, May 8; and Nira 80, May 0. Two 10 mg. pellets of alpha estradiol were then implanted in May's abdominal fascia, and after she achieved the maximum-tense condition of sexual swelling she was tested against both Lia and Nira in the food competition situation. The scores for these tests over a series of our sessions in comparison with these animals reveal that the estrogen administration had not bridged the dominance gap between May and the animals with whom she was in competition. The scores were: Lia 80, May 0; Nira 80, May 0. After the testing the fragmented pellets of alpha estradiol were removed, and two 75 mg. pellets of testosterone were inserted into the abdominal fascia in their place. Tests given ten days after the testosterone implantation showed no change in the dominance relationship between May and the other two animals. The scores for the entire series of four tests with each were 80 to 0 in favor of Lia and Nira as compared with May. At no time in the course of the tests given when May was in full-swelling did either Lia or Nira stand aside or give her privilege in any way. They behaved toward May under the condition of swelling precisely as they did when she was in the permanent-residual condition, or when she was under androgen dosage; namely, did not permit her to take a single nut. These data make it improbable that "privilege-granting" existed among our animals. For if it had been operating some behavioral sign should have appeared in the course of our observation.

One other item of comparative evidence is required before we can draw our conclusions. Our argument is given increased weight by a comparison of the pre-castration mating records of May and Nira. Nira was an animal who in the course

of five years of existence as a mature female had been known to copulate only once despite frequent attempts on the part of the staff to induce regular fertile mating. May, on the other hand, was an individual who mated both frequently and willingly whenever she was paired with a male at the swelling-stage of her cycle. Further, at the time of the present tests May was experimentally mated with several males when the induced swelling reached the maximum-tense stage, and on all occasions mated very readily.

Thus, we may summarize our findings as follows: May, in swelling, is receptive but remains at a low level of aggression. Nira, in swelling, is not receptive but increases in aggressiveness and in irritability. May's receptiveness does not induce any change in the behavior of the dominant animals. When Nira enters full swelling, the dominant animal, Lia, yields to her despite the fact that Nira in swelling is unreceptive. To have been confirmed, the hypothesis that there is socially acquired "granting of privilege" in female-female relationships required that the dominant female should have shown a lessening of aggressiveness in response to signs of sexual receptivity in the subordinate female. This did not occur. On the contrary, it was to the non-receptive, but aggressive female that the lessening of aggressiveness was manifested. Therefore we conclude that the response of the dominant animal was to signs of increased aggressiveness, and not to receptivity.

We realize that our experiment with May does not constitute a fully crucial test of the granting of privilege concept. However, we do advance it as ancillary evidence which indicates that the concept is not applicable to female-female pairings. Since there was no behavior which could have been interpreted as privilege-granting in the Lia-Nira tests, and no indication that privilege-granting was operating in the tests using May, it seems well-founded to eliminate it as a relevant feature of dominance enhancement at estrus in female-female combinations.

DISCUSSION

A discussion of the effects of androgen and estrogen administration on the social behavior of the female-castrate chimpanzee can follow two somewhat independent lines of inquiry. In the following section we will attempt to pursue both of them. The first necessity is the examination of the relation of the behavioral effects produced by the different sex-hormones on female-castrate dominance status. A further extension of this line of

discussion leads directly to the comparison of the effects of sex-hormone dosage on the social dominance behavior of male-castrate as contrasted with female-castrate chimpanzees. The second task of the discussion is the integration of the data obtained in the present study with the general body of information and theory concerned with the nature of the effects of female sex-hormone on dominance behavior. The need for such a general treatment is dictated by the fact that in our experiment female sex-hormone produced an improvement in dominance status rather than the decrement in dominance that would have been expected on the basis of previous reports on the effects of estrogen administration on other animals (cf. 7, 24).

1. *Relative Effectiveness of Male and Female Sex-Hormones on Dominance*

There are both similarities and differences in the effects produced by androgens and estrogens on the social dominance behavior of the female castrate chimpanzee. Both types of hormonal administration tend markedly to improve the dominance position of an initially subordinate animal. It is impossible on the basis of the evidence available in the present study to enter upon any discussion of the relative effectiveness of the two kinds of hormone in improving dominance status, since both drugs were given in constant daily dosage at or near the threshold of effective action.⁴ Insofar as general features of behavior outside of the specific food-competition situation are concerned, little or no differences were apparent; with the exception of the fact that under the condition of androgen dosage there appeared to be a slightly greater frequency of masculine struttings and posturings by the treated animal (e.g., the more frequent assumption of the bi-pedal, erect posture, more pounding of the cage walls, etc.).

Only *one* feature of difference in estrogen-androgen effect was suggested by our evidence in the food test situations. It appeared that the behavioral effectiveness of the estrogen continued after termination of treatment only for so long as the swollen condition of the sex-skin persisted. There was no continuance of improved dominance after detumescence. Androgen administration, which was unaccompanied by any signs of change in the condi-

⁴ The level of estrogen dosage given in the present study is sufficient to induce and maintain the maximum-tense condition of swelling in the castrate female chimpanzee. The androgen level is sufficient for full replacement therapy, including normal ejaculation in the castrate-male chimpanzee (5).

tion of the ano-genital area, tended to produce more enduring effects. The improvement in dominance continued to be at least partially apparent for several weeks after the discontinuance of androgen dosage. These facts of androgen-estrogen difference in both sex-skin condition and in duration of behavioral effects raise the possibility that quite different physiological mechanisms may underlie the similarity of behavioral change produced in social dominance relations by the two hormones. The probability of differential underlying mechanisms is increased when a comparison is made between the effects of sex-hormone administration on our female-castrate and the effects of similar treatment upon a male-castrate (6).

Two facts emerge clearly. First, it is found that the dominance status of both the male-castrate and the female-castrate chimpanzee is significantly improved by daily dosage of testosterone. Second, the estrogen effect on the behavior of the male is precisely the reverse of the effect on the behavior of the female. Whereas in the female dominance status is reliably improved by estrogen administration, in the male dominance status is deleteriously affected by estrogen dosage, and the male animal tends to become more subordinate than normal when he is treated with female sex-hormone. In general, when an hormone has an identical effect on both sexes of a given species it may be legitimately assumed that the mechanism underlying the behavior change is similar in both sexes. However, when the same agency produces divergent or opposed effects on the behavior of the two sexes, it becomes necessary to postulate the existence *either* of different primary physiological mechanisms, or to propose that the divergence in hormonal effectiveness is the product of different secondary changes in the two sexes. In accordance with this line of reasoning, it may be stated that the action of testosterone is directly to enhance the dominance status of the chimpanzee in much the same manner as it produces change in other organisms. Thus, the central problem which requires treatment at greater length is the nature of the estrogen effects.

If the idea is accepted that the behavioral changes produced by modifications of sex-hormone level are determined by the manner in which the threshold of arousal of different central neural patterns is altered, then one is forced either to propose that different central-neural effects are produced in male and female animals by the female sex-hormone, or to state that although identical changes occur centrally in the two sexes, different peripheral changes which counteract the central effects are at the basis of the sex-difference in the hormonal modification

of behavior. Although neither of the above possibilities is eliminated or specifically substantiated by our data, there are certain considerations which throw the balance of likelihood in favor of the peripheral hypothesis. Primary among these considerations is the extent to which improvement of dominance status in the intact female (8) as well as in the estrogen-treated female castrate parallels the course of sexual swelling, whereas in the male animal estrogen administration, which produces no modification in the condition of the perianal area, induces a decrease in dominance status. From the standpoint of parsimony it seems advisable to postulate an identical central effect of the female sex-hormone in the male and female animals rather than to assume the existence of different conditions of central-neural patterning for the two sexes. What appears likely is that an identical central-neural effect occurs in both sexes, but that the behavioral resultant in the female is altered by the continuous irritating effect of her swollen genito-anal area. At present we are in the process of completing a series of investigations designed to test this hypothesis, by means of raising the estrogen level in a female castrate under conditions in which genito-anal swelling is prevented. The results of these studies will be reported in a future paper on the mechanisms of estrogen-dominance effects.

At the level of behavioral analysis it is possible to discuss the *facts* of dominance or subordination patterns as modes of social response without regard to the *physiological mechanisms* which contribute to their formation. From the behavioral standpoint it is therefore necessary to conclude that rise in estrogen level, no matter what the underlying mechanism may be, causes an increase in the dominance behavior of the female chimpanzee. The weight of the evidence implies that this improvement cannot be ascribed to a perceptually-based shift in the response of the animal with whom the estrus female is paired, but to a true dominance improvement induced by the estrogen.

2. Some Observations on the General Question of Sexuality and Dominance

The results of the present study, in which female-castrate chimpanzees were used, when considered in connection with Crawford's (8) excellent investigation of the relation of dominance status to the phases of the sexual cycle of the intact female of the same species, leave little doubt that rise in the estrogen level increases the dominance drive of the female chimpanzee. This fact makes it necessary to call into question certain general propositions

which have been advanced most recently by Collias (7) and by Seward (24). Both of these investigators have concluded that all experiments upon the effects of estrogens on dominance and aggressiveness have yielded uniformly negative results. That is, that estrogens either have no apparent effect upon dominance and aggressiveness, or that the effect when it is apparent is to reduce domination and aggressive tendencies. It is difficult to see how these writers could have arrived at such a conclusion in the light of evidence which had been in print several years before the publication of either of the papers to which we have referred. We are thinking especially of Crawford's paper in which he clearly demonstrated the rise in aggressive tendency and dominance with the rise in estrogen level in the intact female chimpanzee. However, since Crawford's subjects were intact animals, it might possibly have been assumed by Seward and Collias that the improvement in dominance status at the height of estrogenic concentration was the by-product of the increased secretion of male as well as of female sex hormone by the ovary at the time of its greatest activity. Such an assumption, however, was excluded by the evidence of Fish, Young and Dorfman (10) on the quantities of estrogen and androgen present in the urine of intact female chimpanzees at different states of the sexual cycle. These investigators showed that although there is a sharp rise in the quantity of excreted estrogen at the height of sexual swelling, no such increase in androgenic substance is apparent. The androgenic concentration of the urine varies irregularly throughout the cycle and bears no consistent relation to the variation in concentration of estrogenic substances. Therefore, the ovarian-androgen hypothesis is untenable on bio-chemical grounds, and our data obtained from an animal whose fallopian tubes and uterus as well as ovaries had been removed prior to estrogen administration indicate further that the rise in dominance is directly associated with the increase in estrogen level. Thus, despite the generalizations of Seward and Collias to the contrary, *it can only be concluded that the estrogen in and of itself produces changes in the female chimpanzee which have the effect of improving her dominance status, and increasing her aggressiveness.*

Certain laboratory observations are of value in supporting this conclusion. It is the general impression of the laboratory staff that it is well to be especially cautious when dealing with a female chimpanzee at the time of the maximum-tense phase of her sexual cycle. Although it is not always the case, increased aggressiveness toward the staff

is a not infrequent accompaniment of the achievement of maximal swelling of the perianal region. At this point in her cycle the animal tends more frequently than otherwise to launch attacks, to make attempts to injure, and in general to be more irritable and with a lowered level of frustration tolerance.

A factor of much discussion and some confusion in the consideration of social dominance behavior has been the relation of dominance and subordination to the male and female mating pattern. In the main it has been explicitly or tacitly assumed that the feminine rôle is part of a submissive pattern of behavior, and that the male rôle of mounting, etc., represents a portion of a more general aggressive and dominant social behavior pattern. Collias (7) has made this concept explicit, and has gone so far as to pass a value judgment upon it. He states that "masculine aggressiveness in females, if excessive, might hinder mating," and implies that feminine submissiveness is a good thing and desirable from the point of view of species survival. Such an hypothesis involves two assumptions, neither of which have any solid basis in the facts of mammalian mating behavior. First, it must be assumed that aggressiveness is essentially a masculine pattern, and second, that the female mating response represents submission to the male. It is the second assumption which has most direct bearing on our argument, and it is with it that we should like to take issue at this point.

It is a well-known *fact* of mating behavior that estrus cows (Hammond 12), sows (McKenzie 20), guinea pigs (Young *et al* 34), rabbits (Hammond and Marshall 13), and rats (Long and Evans 16; and Hemmingsen 14) engage in mounting other females (*i.e.*, assume the masculine rôle in regard to them), but are in their turn mounted by males of the species when these are present. Even in human sexual behavior there is some evidence that an element of aggressiveness accompanies the heterosexual drive with rise in estrogen level (*e.g.*, Benedek and Rubinstein's (2) stage of pre-ovulatory tension). Further, McKenzie and Terrill (21) report that anoestrous ewes, given daily injections of estrogen, displayed after a time the "masculine" mounting pattern, and Young and Rundlett (33) report the same pattern of behavior in estrogen-dosed, spayed female guinea pigs.⁵ In the light of this evidence, if we accept the assumption that

⁵ The papers here mentioned are illustrative instances only, and we make no pretensions of a comprehensive review of the literature. For a multiplication of illustrations and a more inclusive survey of the literature of female mammalian mating responses, cf., the review by Young (32).

manifestation of the female mating response is a sign of submissiveness, and the "male" pattern is a sign of aggressiveness and dominance, we must accept the logical consequences of such a position, namely: That rise in estrogen level in a wide variety of female mammals produces increased aggressiveness and dominance behavior toward females of the same species, but increased submissiveness toward the males. However, it is also a fact of mammalian mating behavior that a female in heat will not infrequently *mount males* as well as be mounted by them. Therefore, the logical conclusion of Collias' hypothesis is not only unlikely, but contrary to fact.

The inconsistencies in the existing theories of the relation of sexuality to dominance appear to us to arise from the confusion of the mating act with dominance-subordination behavior. Since in the infra-human primates presentation, *i.e.*, the assumption of the female mating posture, frequently accompanies subordination behavior, the dominance-subordination behavior of the chimpanzee is admirably suited for the development of our argument concerning the need to distinguish between functional (reproductive) presentation by the female and submissiveness.

In the primates it is true that *the subordinate animal regardless of its sex* frequently presents to the dominant animal, and that the presentation seems to serve as a mechanism of defense in that it sometimes inhibits the attack by the dominant member of the pair (18, 35). However, whether this presentation pattern bears any functional relation to the mating pattern is another question altogether. In the first place, the "presenting" behavior is present and functional as a defense and solicitational mechanism even in the pre-adolescent primate (3, 4). Secondly, there does not seem to be any greater frequency of presentation in the subordinate female animal than in the subordinate male. Further, the *dominant animal may present to the subordinate* to solicit grooming, food, etc. (25). When viewed in this matrix it becomes far more likely that presentation represents a kind of social response which antedates true sexual behavior, and is later incorporated as part of the mating pattern by the female, rather than that it is a symbolic form of sexual abnegation. Thus, presentation (that is, the assumption of the female mating position) may not necessarily be a submissive act at all, but a begging gesture, a reassuring gesture on the part of a very dominant animal, a *demand* for sexual service from a male by a female, and even a prelude to a highly aggressive attack upon

the part of the estrus female when such sexual service is not immediately forthcoming.

An illustration of functional sexual presentation, coupled with aggression was observed by one of us in a recent attempt at an experimental mating between two adult chimpanzees, Wendy, a multiparous female and an active mating animal, and Tom, a large mature male who had up to that time never engaged in copulation. Wendy was in full swelling, and when admitted to Tom's cage at once ran up to him and presented. Tom was unresponsive, and made no attempt to copulate. Wendy at once turned around and launched a vicious attack upon him. In the light of such an observation it is hard to see the female mating response as a generally submissive act. Such a conclusion seems largely to stem from the projection of the Victorian idea of human sexuality into the realm of biological theory.

SUMMARY AND CONCLUSIONS

The effects of the administration of methyltestosterone and alpha-estradiol on the dominance-subordination relations of three adult female-castrate chimpanzees was studied in a food competition situation. The results were as follows:

1. Female chimpanzee dominance status was reliably enhanced by raising the estrogen level.

2. Female chimpanzee dominance status was reliably raised by the administration of androgen.

3. The improvement in dominance status with the administration of female sex-hormone to the female-castrate does not appear to be based on "granting of privilege," but to be a true increase in dominance tendency.

4. Rise in dominance status induced by estrogen administration paralleled the course of the sexual swelling, and disappeared with detumescence.

5. Improvements in dominance status achieved under androgen therapy bear no relation to sexual swelling (since none occurs), and appear to be more persistent than changes produced by estrogen administration.

These results for the female-castrate chimpanzee were discussed in connection with data on estrogen and androgen effects on the dominance behavior of male-castrate chimpanzees, and an attempt was made at a critical analysis and re-synthesis of the available evidence on the relation of sexuality to dominance-subordination behavior in mammals.

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AN ELECTROCARDIOGRAPHIC STUDY OF PSYCHONEUROTIC PATIENTS *

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INTRODUCTION

Numerous reports have appeared in the literature dealing with the electrocardiographic changes in functional heart disturbances. Most of these investigations, however, were undertaken for the primary purpose of ruling out myocardial damage in neurotic and psychotic patients prior to the administration of shock treatment, or for the detection of myocardial changes at the time of the convulsive seizure and at varying periods following therapy (13, 2, 25, 6, 19). Systematic studies of electrocardiographic abnormalities have been reported on a series of such psychoneurotic patients for the purpose of determining a specific pattern in cardiac neurosis (22, 17, 15, 14). Numerous abnormalities have been listed in these publications which would lead one to assume that such deviations are peculiar to this group of patients. Comparisons with large groups of tracings taken from normal patients had not been made. With the advent of the present war, however, large-scale cardiovascular surveys have been conducted on young, healthy aviators acceptable for combat service and it has been adequately shown that similar abnormalities occur in these groups. These surveys, then, afforded an excellent criterion in the present study for comparison with the non-specific abnormalities found in psychoneurotic patients.

Critical review shows that many of these recorded deviations are within normal limits. S-T depressions are frequently observed in the limb leads in patients with functional disturbances; however, the degree of deviation from the reference level was in the majority of cases less than one-half millimeter, and unless other well-defined abnormalities are also present, the record cannot be regarded as evidence of any degree of cardiac dysfunction. T wave inversions in the chest leads taken in the recumbent position are at times found in so-called juvenile hearts, especially under the age of 20 years, and should be regarded as normal.

The purpose of this investigation was to analyze a series of electrocardiographic records on a group

of psychotic and neurotic patients, shown by physical examination and functional inquiry to be free of organic heart disease, in order to ascertain whether certain combinations of these could fit into any definite pattern characterizing this group.

SELECTION OF CASES AND METHOD

Psychoneurotic patients for this study were drawn from two sources. About 80 per cent of these were admitted to the Psychiatric Unit of Michael Reese Hospital for electric shock treatment, and the remainder were drawn from the Psychiatric Out-Patient Department. Only those patients under the age of 40 and giving a negative history or physical findings of organic cardiovascular disorders were selected. There were 57 females and 19 males.

The symptom complex of these patients was varied. Their failure of adaptation was due to anxiety states, tension, depression, and dissociation from reality. All patients selected from the Out-Patient Department had their chief complaints referable to the cardiovascular system. The most common complaints were palpitation occurring with excitement or effort, a constricting sensation in the precordium not necessarily related to exertion and frequently accompanied by a lump in the throat, dizziness, vertigo, and dyspnea with excitement or effort.

Six patients who had shock treatment were recalled after periods varying from six months to one and a half years to determine whether therapy had any effect on their electrocardiograms. All were known to have made adjustments good enough to enable them to return to their work. Standard limb leads and chest leads CF_2 , CF_4 and CF_5 were taken while the patients were in the recumbent position.

RESULTS

(The pertinent data are summarized in Tables I and II.)

Twenty-two cases, in addition to those listed above, showed S-T depressions less than one-half millimeter in leads I and II, and less than three-fourths millimeter in lead III. This degree of deviation from the reference level was regarded as

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insignificant in accordance with the criteria adopted for abnormality for the individual complexes (11).

Only 8 per cent of the records (6 cases) showed definitely abnormal S-T depressions in the limb leads. Two records showed marked depressions in lead III, and 4 records in leads I and II. In the records showing the marked S-T depressions, the heart rate ranged between 75 and 122. Fourteen and four-tenths per cent of the records (11 cases) revealed peaked P waves with an amplitude greater than 2 mm.—3 in lead II, and 8 in leads II and III. These P waves were often associated with other abnormalities in the record strongly suggestive of right heart strain. In two instances, a deep S wave was recorded in lead II. This abnormality was associated in one case with an upright QRS complex in lead I and inverted in lead III with a low T wave in lead I, giving a left heart strain pattern. Five and three-tenths per cent of the

cal evaluation of the patient's cardiovascular status, a diagnosis of heart disease could easily have been made. In this small group, one record showed a definite right heart strain pattern, one a left heart strain pattern, and in two instances non-specific abnormalities suggestive of heart disease; yet, none of these patients have a history of organic cardiovascular involvement or evidence of it upon examination. Two and six-tenths per cent of the records (2 cases) showed changes in one or more leads, and were catalogued as probably abnormal curves. The interpretation of such a record was that although the deviations satisfied the accepted criteria for electrocardiographic abnormality, the general objective impression suggested that only minimal myocardial involvement could have been present. Ten and six-tenths per cent of the records (8 cases) were borderline. In this type of curve, the electrocardiographic deviations were minimal and, depending upon the clinical findings, could be interpreted either as fitting the normal heart or one

TABLE I

ANALYSIS OF THE SIGNIFICANT ELECTROCARDIOGRAPHIC ABNORMALITIES IN A TOTAL OF 76 PSYCHONEUROTIC PATIENTS

	Limb leads	Chest leads
S-T depression (at least 0.5 mm. in I and II; 0.75 mm. in III).....	6	0
Peaked P waves (amplitude greater than 2 mm.)	11	0
T wave small or inverted (in leads I or II)	4	—
QRS complex with deep S ₂	2	—
QRS complex with small R in CF ₂	—	3
Low voltage	1	0

records (4 cases) showed small T waves in leads I and II. One of these records had, in addition, an inverted T wave in lead III, and another a notched T₃. There were no T wave abnormalities in the chest leads similar to those described by Wendkos (22) in his series of neurocirculatory asthenia cases. The only significant abnormality in the chest leads was found in CF₂. Three and nine-tenths per cent of the records (3 cases) showed a QRS complex almost entirely down, or with an R wave in CF₂ less than 2 millimeters. Low voltage in the limb leads was encountered in one instance.

There was no significant alteration in the electrocardiograms of 6 patients who returned for re-examination following moderate personality adjustments.

Five and three-tenths per cent of the records (4 cases) showing abnormalities appearing singly or in combinations were regarded as definitely abnormal curves. Based upon the objective consideration of the electrocardiogram alone without a proper clinical

TABLE II
ANALYSIS OF THE TYPE RECORD FOUND IN 76 NEUROTIC AND PSYCHOTIC PATIENTS

	No. of records
Definitely abnormal curve.....	4
Probably abnormal curve.....	2
Borderline curve.....	8
Probably within normal limits.....	28
Within normal limits.....	34

with a very minor damage. Thirty-seven per cent of the records (28 cases) were classed as probably within normal limits. Such records were interpreted as being just on the fringe of normal because of one or more minor deviations, and had approximately the same value as one designated within normal limits.

Generally, there was no specific body build encountered, although there was a tendency to find the most marked electrocardiographic changes in those of slender build with narrow chests. There was no uniform set of physical findings characterizing this group. Labile heart rates and blood pressures were occasionally encountered. Abnormally short breath holding times were found in only a small percentage of cases.

The findings in this study are exemplified by the following case:

CASE REPORT

A 23-year-old Negro female was admitted to Michael Reese Hospital (on Dr. Sidney A. Portis'

service) because of symptoms suggestive of a marked cardiovascular disturbance.

She was married at the age of 15 years, and shortly thereafter discovered that she was pregnant. Married life, with its newly-imposed responsibilities, was too much for her immature emotional development. Frustration and intense anxiety set up a train of symptoms marked by undue fatigue, dyspnea and palpitation, with choking sensations in the neck on the least effort or even at rest, when emotion was intense.

After delivery she developed resentment and hostility towards her husband and child. These symptoms became worse with the birth of her second child. She then became bed-ridden the greater part of the time. There was no history of chorea, rheumatic fever or congenital heart disease.

EXAMINATION

Examination of this patient revealed a fairly well-nourished Negro female in no apparent distress. There was no evidence of thyrotoxicosis or tuberculosis. The heart was normal in size, regular in rhythm; the apical first sound was loud and reduplicated, P_2 was louder than A_2 ; there were no murmurs. There were no tremors, and the reflexes were normal. Blood pressure was 120/80; pulse was 160 per minute; temperature was 98.6° F.; respirations were 20 per minute. The lungs and abdomen were negative.

The laboratory findings were as follows:

R.B.C. 5.4 million; W.B.C. 6,200; with 64% polys, 30% small lymphs, 3% large lymphs, and 3% monocytes. Hemoglobin, 13.2 grams.

Serology was negative. Gonococci fixation, negative.

N.P.N. 32; B.M.R. minus 3.1; urine, negative; vital capacity 500 cc.

Breath holding time: After a normal breath, 15 seconds; after a deep breath, 7 seconds.

Normal glucose tolerance test.

Fluoroscopy revealed the heart to be of the asthenic, vertical type, and showed no enlargement of any of its chambers and vessels.

The electrocardiogram is shown in Figure 1.

DISCUSSION

The mechanism of non-specific electrocardiographic abnormalities observed in normal, psychotic and neurotic individuals is still not entirely understood. It is generally accepted, however, that the deviations from the normal are associated with an imbalance in the autonomic nervous system. The appearance of these abnormalities is apparently

independent of the degree of nervous imbalance, since in only a relatively small percentage of cases with psychoneurotic cardiac dysfunction do these

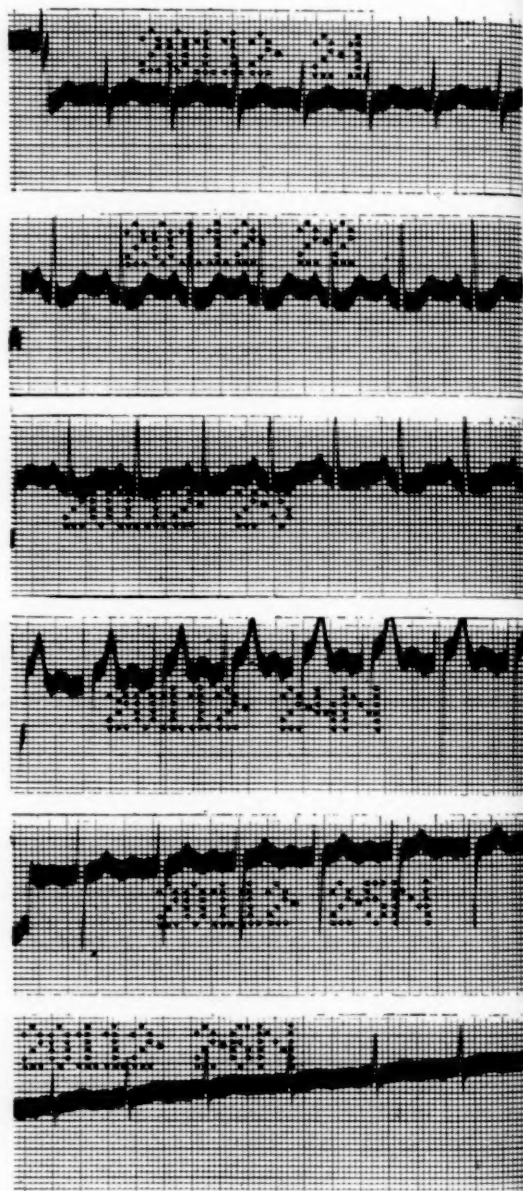


FIG. 1. Record obtained in patient with neurocirculatory asthenia whose case report is given in full. A right axis shift and S-T depressions in leads II and III are present. The leads from top to bottom are: I, II, III, CF_1 , CF_2 , and CF_3 .

occur. Mainzer and Krause (16) showed that an emotion such as fear before an operation produced changes in the electrocardiogram strongly suggestive of transitory coronary insufficiency. When consciousness was depressed by anaesthesia, the elec-

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In an aviators, with an in 2.1 p in leads In the p tude oc leads II, and III sociated plexes i III with the imp well kn low dia shift p the pres with n body ha

trocardiographic record reverted to a normal pattern. This observation was interpreted by them as indicating the marked influence the autonomic nervous system has on the coronary circulation. They suggested that vagal influence was dominant in decreasing the coronary flow. Since, however, there is no unanimous agreement among workers as to the precise action of the sympathetic and parasympathetic supply on the coronary circulation, it would appear hazardous to insist that the essential action of psychic impulses to the heart is directed precisely upon the coronary flow. Furthermore, in all published reports on this problem, as well as in the present investigation, no combination of abnormalities suggestive of a myocardial infarction pattern was observed. It would appear, rather, that the psychic impulses to the heart may act upon any of its elements, producing in this way non-specific deviations from the normal pattern. Further evidence to support the view of the effect of autonomic imbalance on the cardiac mechanism was presented by Wendkos (22), using vagolytic and sympatholytic drugs on normal individuals having an inverted T wave in lead CF₂ of the electrocardiogram. Earlier observations of the effect of emotion on the electrocardiogram (3, 12, 21) contribute little towards a better appreciation of the use of this instrument in differentiating benign from organic heart disease. Since anxiety is the central symptom of nearly all neuroses and psychoses (Yaskin, 24), and all fears either apparent or obscure form the essential component of the psychoneurotic states, it would appear that the electrocardiographic abnormalities noted in such cases may be attributed to inherent fear reactions.

In an electrocardiographic study of 1,000 young aviators, Graybiel *et al.* (7) found that P waves with an amplitude of 2 mm. or greater occurred in 2.1 per cent, and 0.5 per cent of their records in leads II and III respectively, and none in lead I. In the present report, P waves of the same amplitude occurred in 3.9 per cent of the records in leads II, and in 10.7 per cent of the cases in leads II and III. In ten instances, tall P waves were associated with small upright or diphasic QRS complexes in lead I, tall QRS complexes in leads II and III with a slight S-T depression in lead III, giving the impression of a right heart strain pattern. It is well known that persons with asthenic body builds, low diaphragms and small hearts show a right axis shift pattern in the electrocardiogram (17). In the present study only 60 per cent of the patients with neurocirculatory asthenia had this type of body habitus, and only one-third of this group had

right axis shift. This has been the experience of other workers in this field (9, 22, 15).

Graybiel *et al.* (7) showed that deep S₂ waves greater than 4 mm. occurred in 2.4 per cent of their records, while Hall *et al.* (10), on a similar study of 2,000 young aviators, found S₂ greater than 3 mm. in 20.7 per cent of their records. In the present investigation, the presence of deep S₂ waves was observed in only 1.5 per cent of the records. This suggests that the occurrence of a deep S₂ wave alone, unassociated with other well-defined abnormalities in the electrocardiogram, should be regarded as an individual variation and not indicative of myocardial damage.

Flat or small T waves in leads I and II occurred in 5.3 per cent of the present series of records. Graybiel *et al.* (7) reported inversion of T₂ in 0.2 per cent of their records in a large group of healthy individuals, and Hall *et al.* (10) in a similar study observed this abnormality in 0.3 per cent of their cases. Graybiel and White (9) reported seven cases of neurocirculatory asthenia, known to be free of organic heart disease, showing inverted or flat T waves in leads I and II. According to these workers, there was no evidence in these cases to indicate inadequacy of the coronary circulation to explain the abnormality in the T wave. White *et al.* (23) observed T₂ inversions occurring occasionally in persons with asthenic habitus and vertical hearts. They suggested that this electrocardiographic abnormality may be produced either by variation in position of the heart, depression of the diaphragm or by overventilation resulting in alkalosis. Barker *et al.* (1) reported that alkalosis decreased and acidosis increased the amplitude of the T waves in the limb leads, and believed that abnormal T waves produced by voluntary hyperventilation may be due to alkalosis. When they induced alkalosis by feeding large quantities of sodium bicarbonate (25 to 50 grams) to normal patients, they were able to produce in 5 out of 7 cases similar T wave changes. However, they were unable to show a strict parallelism between the pH of the blood and the electrocardiographic changes. Thompson (20) explained the T inversions found in tracings of patients with anxiety neurosis and the hyperventilation syndrome as being due to alkalosis. He believed that smoking may produce similar changes by deep inspiration, contrary to the view of Graybiel *et al.* (8) that flattening or inversion of the T waves in the limb leads are due to the toxic action of nicotine. Scherf and Weisberg (18) presented convincing evidence showing that the alterations in the T waves may be attributed to the diaphragm during respiration. Logue *et al.* (15), from a study

of 74 cases of neurocirculatory asthenia, reported 30 per cent of their records showing low T waves. In a recent report, Loftus *et al.* (14) studied a series of 41 cases with anxiety neurosis, with only 2 cases (5 per cent) showing low amplitude of the T wave in leads I and II, which is in close agreement with the findings of the present investigation. Their other 39 cases apparently showed no electrocardiographic deviations from normal, in spite of the marked personality disorders, which is significant. Other workers (5, 4) have observed transient T wave inversion in lead II following a paroxysmal ventricular tachycardia in patients without psychoneurotic personality patterns.

T wave inversions in the precordial leads were not observed in the present investigation. Wendkos (11) reported T inversions in CF₂ in 4 cases of neurocirculatory asthenia and ascribed this change to a preponderance of either the vagal or sympathetic tone—not to the position of the heart, since the stability of the inversions was unaffected by postural changes. Logue *et al.* (15) recorded 3 per cent of their cases having the T wave inverted in lead CF₂. Inverted T waves in lead CF₂, having the characteristic feature of a long descending and short ascending limb, have been commonly observed in normal infants' and children's electrocardiograms. Occasionally, similar T inversions in this lead have been noticed in young, healthy adults and their occurrence has been ascribed to the residual qualities of the juvenile heart (11); for that reason, it is not a characteristic feature of autonomic imbalance in psychoneurosis.

S-T segment depressions occurred in 8 per cent of the present series of records. This abnormality has been frequently observed following shock treatment and in electrocardiograms of emotionally unstable individuals. However, the degree of deviation of the S-T segment from the reference level, or how commonly this abnormality occurs, had not been recorded. While 36 per cent of the present records reveal S-T depressions in the limb leads, actually only 8 per cent of these showed depressions of at least 0.5 mm. in leads I and II, and 0.75 mm. in lead III, taking the P-Q segment as the reference level. Graybiel *et al.* (7) found 0.9 per cent of their records of 1,000 normal aviators showing a mean S-T junction depression of 0.64 mm. in lead I, 1.2 per cent of the records with a mean depression of 0.46 mm. in lead II, and 7.7 per cent with a mean depression of 0.33 mm. in lead III. Since S-T depressions occur in a variety of electrocardiographic patterns indicative of disease involving various cardiac elements, the significance of this abnormality in benign cardiac dysfunctions is difficult to

evaluate. It is significant, however, to note that this abnormality occurs at least six times more commonly in patients with personality disorders than it does in normal individuals under the age of 40 years.

SUMMARY

1. A comparison between electrocardiographic abnormalities found in psychoneurotic patients with those of large groups of individuals known to be free of organic heart disease was made.

2. There is no combination of abnormalities which fits a distinct pattern characterizing this group electrocardiographically.

3. There is a tendency for about 12 per cent of these cases to present a right heart strain pattern. This is suggested by the tall P waves, right axis shift and S-T depressions in the limb leads.

4. Deep S₂ waves as an isolated abnormality occurred almost as frequently as in routine electrocardiograms of normal young individuals.

5. Flat or inverted T waves in leads I and II occurred about fifteen times as frequently in psychoneurotic patients as in a large group of young, healthy aviators.

6. S-T depressions of at least 0.5 mm. in leads I and II occurred about six times more frequently in these patients as compared with normal individuals.

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FELS INSTITUTE'S PROGRAM AND FACILITIES EXPANDED

The Samuel S. Fels Fund of Philadelphia announces the erection of the new research laboratory building on the Antioch College campus at Yellow Springs, Ohio. The new building, to cost about \$400,000, exclusive of equipment, is to house the activities of the Fels Research Institute. The Institute's program, devoted to the study of growth and development of children, is being expanded considerably in the following areas: Biochemistry with emphasis on blood and urinary enzymes, vitamin adequacy, ketosteroids, estrogens and other hormones, in relation to growth progress and behavior; Genetics with emphasis on the inheritance of biochemical and physiological function patterns and growth patterns; Physiology with emphasis on resistance level to physical or emotional stress in relation to predisposition to psychosomatic disease and personality.

To house these activities and those of the Psychology and Physical Growth sections, physiological, physical growth, biochemical and psychological laboratories, as well as office and library space will be provided.

A new scientific advisory board has been created, consisting of Dr. Robert Yerkes, Yale, psychology; Dr. Ashley Weech, Cincinnati University, pediatrics; Dr. E. V. Cowdry, Washington University, anatomy; and Dr. Maurice Visscher, University of Minnesota, physiology. The Institute, established in 1929, is under the direction of Dr. L. W. Sontag.

INGUINAL HERNIA IN PSYCHIATRIC PATIENTS

PAUL BERGMAN, Ph.D.*

The following report deals with an unsuccessful attempt to correlate the presence of a constitutional defect with mental illness.

BACKGROUND

At present we are unable to show that psychological maladjustment arises entirely from unfavorable environmental conditions. We know that extremely maladjusted individuals may develop in what seems to be a favorable environment and that relatively well-adjusted individuals may emerge from a series of experiences that we would expect to be markedly traumatic. Freud, who originated psychodynamic thinking, never doubted that constitutional and experiential factors play complementary rôles in the genesis of mental illness.¹

This hypothesis of a combined constitutional-environmental determination led us to seek for a condition including both a congenital physical factor and a psychiatric maladjustment in the hope of demonstrating their interrelationship. The modern biological views of sex constitution suggest an approach to the problem. These views may be summed up as follows: basically every individual is bisexual or male-female. What appears as the sex of an individual is in fact only the dominant sex of the individual. Normally there is a definite preponderance of either the male or female factor to assure the individual's development clearly in one or the other direction. Disturbances in this quantitative relationship bring about a wide range of irregularities producing traits of both sexes together in the same individual.

In a number of species the phenomenon of sex inversion occurs either during the embryonic period or later in life. In these species, because of change in quantitative relationships, the latent sex supercedes the overt one. Depending on the time when the "turning point" is reached, there are three kinds of changes: (a) there may be very little structural

change—because the organs are already well formed; (b) there may be a variety of impressive structural changes resulting in a hermaphroditic picture; (c) in case of a very early turning point, hardly any trace of the originally dominant sex remains, but anomalies in the progeny will indicate that the individual's genetic sex was different from the apparent one.²

While biologists assume that the general laws of sex constitution are also valid for man, their evidence for this assumption is scant since no supporting evidence from genetic experiments is available.

The student of modern psychology, on the other hand, knows how eminent a rôle homosexual tendencies play in almost every maladjustment. It is true that we have come to understand many of these tendencies in terms of other, non-sexual factors, such as conflicts, hostility, frustrations, anxieties, and moral standards. But generally there is not much doubt that a constitutional factor still plays a more or less important, co-determining rôle in homosexuality, whether overt or latent. The question then naturally arises whether a meeting ground between the biological and the psychological concept of a bisexual constitution may be found.

INGUINAL HERNIA AND INTERSEXUALITY

A brilliant and speculative paper published in 1936 (10) offered the hypothesis that inguinal hernia may be regarded as a symptom of latent intersexuality. Attention was there called to the fact that congenital inguinal hernia occurs in the male when the processus vaginalis peritonei remains open, which may be a consequence of a delay in the decisive turn of the embryo towards male sex development; reasons were also given to warrant the belief that the same relationship is true for acquired inguinal hernia. Zoologists have observed that scrotal hernias and manifestations of intersexuality are frequently to be found in the same boar, and that certain boars beget both hermaphrodite sons and sons suffering from congenital hernia.

² R. Goldschmidt, who first studied these phenomena, invented and reserved the name of inter-sex for the cases of sex inversion. Inter-sex has, however, become a term loosely used for any individual that seems to partake of characteristics of both sexes. Goldschmidt, R.: *Die Sexuellen Zwischenstufen*. Berlin, 1931.

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¹ To quote one of Freud's many pertinent passages: "We divide the causes of neurotic disease into those which the individual himself brings with him into life, and those which life brings to him—that is to say, into constitutional and accidental. It is the interaction of these that as a rule first gives rise to illness." Freud, S.: *The Predisposition to Obsessional Neuroses*. Coll. Papers, Vol. II, London, Hogarth Press, 1924.

The point of view presented, as far as inguinal hernia is concerned, is not in conflict with what apparently is being maintained by surgeons in general. "There is now general agreement that no single isolated or individual trauma produces inguinal hernia in a normal individual unless there is a laceration of the underlying structure" (8). The generally accepted etiology of inguinal hernia is "a congenital absence of the normal protective barriers" (8).

While surgeons in general accept the preponderantly congenital etiology, there has also been some indication that there may be a relation between disposition to inguinal hernia and a body build possibly related to intersexuality. Individuals of the "female abdominal type," which is defined as a certain numerical relation between distantia spinarum and diameter of the aperture, are particularly predisposed to inguinal hernia (9).

It was on the basis of such considerations and speculations that we undertook to examine whether material could be found in support of the following hypotheses:

(a) Mental disease is more frequently found where there is a constitutional factor of intersexuality present.

(b) Inguinal hernia can be regarded as a symptom of intersexuality.

The preliminary question which we put before ourselves then was: Is inguinal hernia found more frequently in the mentally sick than in the general population? A positive answer to this question would not by any means be equivalent to a verification of the two hypotheses, as the findings would be amenable to any number of other interpretations. A negative answer, on the other hand, would not deal a death blow to either hypothesis, but would at least make one of the two less likely to be true, as additional hypotheses would become necessary for maintaining them.

Searching for literature on this subject we found only one paper, published in 1941 (1), which refers to "the relative greater incidence of direct inguinal hernias in mental cases as compared to normals."

Our own material³ does not allow a check upon the incidence of direct versus indirect hernia. It contains 85 hernia cases but the records of only 10 reveal whether the patient had direct or indirect hernias (8 were indirect and 2 direct). However, as we are subsequently going to show, the total incidence of inguinal hernia seems to be about the

same in mentally sick persons as in the general population.

THE INCIDENCE OF INGUINAL HERNIA IN THE GENERAL POPULATION

Since, first of all, inguinal hernia is a disability that affects certain age groups (infants, older people) far more than others, it is essential that the groups to be compared should be of parallel age distribution if one wants to ascertain the relative frequency of occurrence of this defect. Secondly, one has to try to establish the total number of inguinal hernias, operated upon or not operated upon, in order to avoid obtaining data distorted by economical and educational factors, or factors of availability of medical care. As we shall presently see, no statistical material that fulfills these requirements appears to be extant.

Of the data that have some age specification, the data of the Armed Services are the most extensive and valuable. Of 2,754,000 men examined for duty in the First World War, 4% between the ages of 21 and 30 had a hernia or enlargement of inguinal rings well enough developed to cause rejection from military service (6). Slightly more than 2% were rejected because of a patent inguinal hernia. However, the standards of the examinations which yielded these data varied considerably. With the progress of the war, in particular, there was a general lowering of standards until in 1918 cases of remediable hernias were no longer rejected. Furthermore, repaired hernias generally were not included in the statistics. The actual percentage of hernias therefore must have been far above 2%. As to inguinal rings, it seems better to eliminate them entirely from statistical consideration, as examiners agree about only one point, namely that they use different standards (4).

Reports of examinations in recent years (7) contain the following data on inguinal hernia.

TABLE I
RATES OF DEFECT PER 1,000 EXAMINATIONS

	White and Negro	White	Negro
Hernia, inguinal, direct	1.3	1.3	.9
Hernia, inguinal, indirect	5.7	5.9	4.2
Hernia, inguinal, unspecified	21.0	21.4	18.0
Hernia, unspecified	1.7	1.8	.6
Herniotomy	10.5	11.4	3.8
Inguinal hernias	40.2	41.8	27.5

Assuming that most of the unspecified hernias and most of the "herniotomies" would be of in-

³ 868 cases selected at random from the files of the Menninger Clinic in Topeka, Kansas (244), and the Topeka State Hospital (624).

guinal type, we arrive roughly at a rate of 4%, for the age group 20-34. However, it should be considered that the draftees were mostly in their early twenties and that the incidence of hernia in a sample that would be evenly distributed over the different years would be still higher.

A painstaking statistical study of a large number of civilian white males (11) may be helpful at this point, though the group studied did not correspond in social and economic level to the socioeconomic distribution of the general population or to that of the draftees.

In summary, then, we may say that for the age group 20-34, 4% is a low estimate of the incidence of inguinal hernias, repaired plus unrepaired. The age increase rate of hernia incidence of Table II, however, may be used to calculate the probable distribution of hernia incidence over draft age ranges in the general population.

THE INCIDENCE OF INGUINAL HERNIAS AMONG PSYCHIATRIC PATIENTS⁶

We examined the records of 244 male patients of the Menninger Clinic (MC), Topeka, Kansas, and

TABLE II
INCIDENCE OF INGUINAL HERNIA, IN AGE GROUPS
(According to Sydenstricker and Britton)

Age group	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	
Inguinal hernias, truss, in % .....	.4	.8	1.2	1.9	2.7	3.9	4.6	6.8	9.2	11.7	
Age group	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70
Inguinal hernias, no truss, in % .....	.9	1.3	1.7	1.9	2.5	2.7	3.7	4.4	5.0	4.6	7.1
Total	1.3	2.1	2.9	3.8	5.2	6.6	8.3	11.2	14.2	16.3	

Here, again, hernia was only of interest to the examiners as long as it was an impairment. Operated hernias were consequently not included in the above tables. The resulting 2% for the age group 20-34 again must then be considered a too low estimate. At any rate, we note that the frequency of hernia rises steeply with increasing age. The age group 55-59, for example, shows an incidence of 9%, excluding men whose hernias were operated.

There are several factors that may explain the difference in the results of the civilian investigation and the military one, 2% versus 3% (*i.e.*, after deduction of the 1% herniotomies). Firstly, there may be some non-inguinal hernias among the unspecified in the military statistics. Secondly, there may be a somewhat lower incidence of hernias among economically higher groups that are preponderant in the civilian study, a factor which should not be of great importance, however, according to some authorities.⁴ Thirdly, and most importantly, we may assume that many hernias have been repaired among the group of middle and upper-class men who have been accepted as policy holders by life insurance companies. Unfortunately, there are no reliable statistics on the incidence of operated hernias in definite age groups.⁵

⁴ Moorhead, loc. cit., "In relation to white-collar labor by comparison to hard laborers the proportion (*i.e.*, the difference) is not so great as you might think."

⁵ A very instructive and thorough personal communication from L. I. Dublin, Second Vice President and Statistician of

of 624 male patients of the Topeka State Hospital (TSH). The total number of hernias in these two groups was 25 and 61 (10.3% and 9.8% respectively).⁷

Seventy-eight MC patients and 227 TSH patients belonged to the age group 20-34. Of these, 7 MC and 11 TSH patients had inguinal hernias, either operated upon or not operated upon. That is to say, 9% and 4.8%, respectively, of the patients of the age group we chose for comparison had inguinal hernias. The MC group, however, has to be eliminated from further statistical comparison; because of some chance factor it had an unduly high number of hernias in this age group, while as a total group it had no more than apparently should be expected.⁸ This is the age distribution of the two patient groups:

the Metropolitan Life Insurance Company, confirmed this fact.

⁶ Much of the following statistical material was gathered by Miss Elaine Grimm, psychology interne at the Menninger Clinic.

⁷ This coincides very well with Moorhead's estimate of the incidence of inguinal hernias in the general population; namely 10%, for the group 20-70, Moorhead, loc. cit.

⁸ The MC group has 4 hernia cases in the age group 30-34, but only 2 cases in the age group 35-39, where a greater incidence would have to be expected. (See Table II.) The number of patients in both age groups is identical (32). Among 25 MC patients of two combined age groups, 51-60, only one hernia case was found. Such irregularities due to the small size of the sample necessitate elimination of the sample from statistical consideration.

TABLE III

Age group	MC	TSH
20-24	19	79
25-29	27	81
30-34	32	67

Both these groups therefore have a higher age average than the corresponding military group that is heavily weighted in the lower twenties. We have, at this point, to consider whether the statistical differences between the 4.8% of the TSH group on the one side and the 4% of the military group on the other side might be statistically significant.

We may weigh the relative weight of the age groups in the two populations we compare.

TABLE IV

"ARMY"⁹ AND "TSH" POPULATIONS DISTRIBUTED IN AGE GROUPS

Age group	Army		TSH patients		
	Number	Percentage	Number	Percentage	Inguinal hernia cases
20-24	51,752	46	79	35	1
25-29	42,446	37	81	36	6
30-34	19,224	17	67	29	4
Total	113,442	100	227	100	11

After equating for age distribution the State Hospital population still has an incidence of hernia 0.4% higher than the military group.

On a purely arithmetic-statistical basis this difference of 0.4% would be significant and could be interpreted as meaning that inguinal hernia is more frequent among the TSH group than among the Army group. In fact, already a difference of more than 0.0426% would be significant according to standard methods.

However, we have to consider that a number of draftees were not being examined for inguinal hernia because they were immediately rejected for some other defect. In a larger number of cases hernia may have been found but not included in the summary from which the statistics were developed, because other defects were considered more important reasons for the rejection of the draftee. Furthermore, a great number of successfully operated hernias were no doubt not taken as reasons for rejection, the "herniotomies" probably having been considered as such only if there was an impairment. In fact the Army admitted a number of draftees with open hernias and provided surgical care for them. We conclude, therefore, that

⁹ The figures for the "Army" population are computed from the above quoted Medical Statistics Bulletin, No. 2.

there seems to be no significant difference in the incidence of original hernia in the two populations we compared.

ADDITIONAL INVESTIGATIONS

We made a number of attempts to correlate incidence of inguinal hernia with certain psychiatric diagnoses, certain biographical data, certain results of psychological tests. None of these attempts yielded a significant positive correlation.

Finally we examined the relationship between females and males in the immediate fraternity of our patients. It had been suggested (10) that research should be directed towards disturbances of the normal relationship in the progeny of human beings that might be analogous to those found in animal species. A paper published in 1940 (5) examined the families of male homosexuals and found that among their brothers and sisters the sex proportion is abnormally high in favor of the male sex (2,078 brothers, 1,685 sisters; ratio 123-100, while the normal ratio is about 106-100). The author's conclusion, later concurred in by other authors (12), was that some homosexuality arises on the ground of biological intersexuality. Again, other authors (2) have noted similar phenomena (respectively the opposite deviation from the normal sex distribution) in the families of peptic ulcer and gall bladder patients. As to the latter observations, we do not feel in a position to comment on them. Prevalence of brothers in the families of male homosexuals, however, could well have been predicted, and can well be explained, on the basis of psychodynamic deliberations. It is well known that one type of homosexuality overcompensates hatred and rivalry of the brother (3). This constellation will occur particularly when there are only brothers or only one brother in the family of the homosexual.

We examined the family records of psychiatric patients of our study, both of the hernia and of the non-hernia cases. Nowhere was there significant deviation from the normal numerical relation between the two sexes of siblings.

CONCLUSION

The hypothesis in question cannot in a strict sense be confirmed or proven wrong by the method used in the present paper. The data of the two populations compared were not collected and recorded in the same manner. For a definitive answer medical observations especially developed to check the condition of inguinal hernia in large comparable groups would be necessary. On the basis of the present inadequate material we may however

say that there seems to be no evidence for a higher incidence of inguinal hernia among psychiatric patients than among the general population. Speculations about a relationship between intersexuality and disposition to mental disease are apparently not borne out on the hypothetical testing ground of inguinal hernia.

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EDITORIAL NOTE

The attempt of the author to correlate a constitutional (hereditary) defect with mental illness constitutes in essence a study of one of the aspects in the preparation for illness of patients who develop mental disease. The preoccupation with the conventional problem of heredity and environment seems perhaps to take as much space in psychosomatic literature as it takes in the literature of many other medical fields. The definitive findings in both cases are equally miniscule.

It would seem in this connection that a further factor must be operative to which we are paying insufficient attention. A number of studies, especially by Dunbar, would indicate that the further

factor of pseudo-heredity (exposure to a given disease as experienced by parent, relatives, friends, etc.) is crucial for the adequate understanding of a patient's preparation for illness.

In this framework it becomes obvious that to determine only whether a parent has heart disease, diabetes or inguinal hernia without further investigation of the kind and extent of the patient's exposure to this parent is of very limited value and possibly misleading. To quote from Dunbar: "... there was a greater tendency to exaggerated symptomatology in patients thus exposed (to heart disease in parents or relatives) than in patients who had merely the heredity without the exposure."—SIDNEY RUBIN, M.D.

FELLOWSHIP ANNOUNCEMENT

The National Committee for Mental Hygiene, Inc., offers fellowships for training in child guidance clinic psychiatry. The training is for positions in community clinics where psychiatrists, psychologists, social workers, and others collaborate in the treatment of children suffering from emotional or mental illness.

Some of the fellowships are for two years; some for one. The stipend is \$2,600-3,000 for the first year, and more for the second. Prerequisites are graduation from an approved medical school, a general internship and two years of general psychiatry. Military psychiatry will be accepted for at least a part of the two years.

Opportunity is provided for the fellow to develop his own skills in a well-organized service with the support of a carefully planned training program and adequate supervision. The training centers are selected on the basis of standards which have been established by the National Association of Child Guidance Clinics.

For further information write to Dr. Milton E. Kirkpatrick, Director, Division on Community Clinics, The National Committee for Mental Hygiene, Inc., 1790 Broadway, New York 19, N. Y.

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REVIEWS, ABSTRACTS, NOTES, AND CORRESPONDENCE

FOURTH ANNUAL MEETING

The Fourth Annual Meeting of the American Society for Research in Psychosomatic Problems will be held in Atlantic City on May 3rd and 4th, 1947.

The Program Committee invites members and friends of the American Society for Research in Psychosomatic Problems to submit abstracts of papers which they would like to present. Three typewritten copies of abstracts, from 500 to 1000 words, should be sent to the chairman, Dr. Edward Weiss, 269 South 19th Street, Philadelphia 3, Pennsylvania.

These should be submitted *not later than March 1,*

1947. The descriptive abstract should include the object of the study, methods used and a summary of the findings.

Planned sections of the program will include the following topics: medical education, the psychosomatic aspects of muscle and joint dysfunction, and a symposium on the use of projective techniques in psychosomatic diagnosis and therapy.

Chairman: Dr. Edward Weiss

Dr. Carl A. L. Binger

Dr. William Dock

Dr. Magnus Gregersen

Dr. M. R. Harrower

Dr. Leon J. Saul

Dr. J. Murray Steele

ANNOUNCEMENT OF THE NATIONAL SOCIETY FOR MEDICAL RESEARCH

The National Society for Medical Research, a clearing house for information on medical studies and discoveries, has been organized under the sponsorship of the Association of American Medical Colleges with the cooperation of 101 national scientific organizations.

Dr. Anton J. Carlson, President of the National Society for Medical Research and Professor Emeritus of Physiology at the University of Chicago, has announced the establishment of the Society's headquarters office in Chicago, Illinois. Ralph A. Rohweder, 1946 President of the Chicago Junior Association of Commerce and former consultant and editor for the National Safety Council, has been appointed Executive Secretary.

The Society has as its purpose the advancement of research in medicine, biology, pharmacy, dentistry, and veterinary medicine.

Dr. Carlson emphasized that an important function of the Society is to analyze and expose the propaganda of small but highly vocal groups which object to the use of animals in the experiments without which medical science would still be in its infancy.

THORACOPLASTY AND CLAUSTROPHOBIA *

JEROME HARTZ, M.D.**

The occurrence of anxiety states and restlessness before the major surgery of thoracoplasty is not uncommon and excites little comment. Once the operation is done, these overt states tend to recede and disappear fairly quickly. It is the purpose of this note, however, to point out a situation in which the reverse occurs, and which leads to many difficulties in post-operative management unless the nature of the psychiatric episode is understood.

Those cases in which I have seen this post-operative exaggeration of anxiety symptoms have gone through the first and second stages of the operation without excessive anxiety; then, following the last stage, the patient becomes increasingly restless, anxious and "jittery." He becomes openly fearful, begins to breathe shallowly and rapidly, and often can scarcely find time to speak between these labored but shallow breaths. At this point in usual clinical management, bromides or barbiturates or both are being given in large doses, but characteristically they seem to excite rather than sedate. If these drugs are pushed hard delirium is apt to develop, though this delirium ceases fairly promptly on the withdrawal of the drugs.

Two brief case histories illustrate this reaction.

(1) The patient was a miner in his middle forties who had developed moderate silicosis and some shortness of breath several years before becoming ill with pulmonary tuberculosis. He had been given work above ground as soon as his silicosis had been discovered. The tuberculosis that later complicated his silicosis announced its presence by hemoptysis and he was found to have a large (5 cm.) cavity in one apex. Thoracoplasty was performed in one anterior and two posterior stages. After the first and second stages the patient developed peptic ulcer symptoms which were promptly relieved by his being put briefly on Sippy régime. There were no outstanding anxiety symptoms until after the third stage, when he at once became restless, tense and sleepless, and had severe recurrence of his ulcer symptoms. He cried some, insisted on being out of doors all the time, and complained of terrifying nightmares. Sedation with bromides and barbiturates was tried without avail.

* My thanks are due to Dr. Fred H. Heise and the staff of Trudeau Sanatorium for the opportunity of seeing these cases.

** From the Henry Phipps Psychiatric Clinic, Johns Hopkins Hospital, Baltimore, Md.

At psychiatric interview he was tense and anxious, and coughed frequently. His respirations were shallow, the rate varying from 30-45 per minute. He said he was frightened and couldn't get his breath. The walls seemed to be closing in on him and it was only out-of-doors that he could get some relief from this fear. When he fell asleep briefly he would wake with a sudden start, shivering and sweating, from a dream of the walls collapsing on him or of being crushed at the bottom of a mine. He said that he could stand the first two operations, but the third had been just too much. The thing he most wanted to do was to go home to his wife.

The patient's father had been a miner before him, and the patient went into the mines too, although he had never felt entirely comfortable below ground. From time to time he had quit mining for a year or two to work above ground elsewhere. He had married in his thirties, never having had much luck with women until he met his wife, who was a good deal older than he. He spoke glowingly of her abilities as homemaker and cook, and it was apparent that she was a strong maternal figure and quite protective. Further discussion revealed that a compensation claim had been unsettled for a year, and the patient believed he had to return home in order to get the matter straightened out.

The patient gave the impression of being an emotionally immature man who had gotten beyond his emotional depth by being separated for a long while from a protective, mothering wife, and having old and deeply hidden fears of being crushed reactivated by an extensive operation that realistically encroached on his breathing space.

When arrangements were promptly made to have him transferred home and to get his compensation hearing planned, he responded with great celerity. That very afternoon he fell asleep calmly, and the following day began to eat whole meals again. His anxiety was very much diminished.

(2) The second case is a single woman in her middle forties, an advertising executive by profession. She had had a two-stage thoracoplasty and developed an acute spread of her tuberculosis to the side opposite immediately after the second stage. The situation became grave when this new area of disease promptly cavitated, and pneumothorax had to be instituted on the side opposite to the thoracoplasty. The pneumothorax was successfully induced and the pressure followed carefully for the first five

days, during which the patient grew rapidly more anxious and fearful. She could not sleep or eat, coughed and wheezed a great deal, and sat upright in bed day and night, breathing rapidly and shallowly.

For some time past she had been getting sodium amylal gr. iii at bedtime, plus i-ii grs. codeine during the day in divided doses for cough. As her anxiety increased, luminal grs. ss t.i.d. was added, the night dose of sodium amylal increased to grs. vi, and finally bromides grs. x q.i.d. was given, too. All of these increases were gradual and were meant to cope with increasing anxiety symptoms. The culmination was a brief period of delirium on the fifth night after the induction of pneumothorax.

When seen the next day the patient showed great apprehension. She breathed rapidly and her face grew fearful with each breath. She coughed and wheezed so much that it was difficult for her to speak. She stated that she had had insomnia all of her adult life, rarely sleeping more than four hours nightly, but now she couldn't sleep at all because she was afraid she would suffocate if she fell asleep. During the interview she urged me several times to open the windows to the utmost. Her claustrophobia was of long-standing too, and had kept her all of her life out of closed elevators, nor could she ever use a bathroom without a window if she were forced to close the door.

The patient had never married because she had had to support a widowed mother and a deaf brother. As she described this situation her attitude seemed one of resentment, mixed with emotional dependence on these two people.

She said that she had been all right following the first stage of her thoracoplasty until several nights post-operatively when she suddenly developed fluid on the operative side. She became somewhat breathless and was greatly relieved when the fluid was withdrawn and did not recur. She had got through the second stage fairly well, but became upset and ill when the spread of disease to her "good" side had occurred. It was at this time that the increasingly heavy sedation was begun.

When the cavity appeared on her "good" side and pneumothorax was suggested, she was secretly

terrified, for she had heard that fluid sometimes appeared after pneumothorax and she feared that it would appear suddenly some night and suffocate her in her sleep. For the five nights following the initiation of the pneumothorax she stayed awake, sitting up, afraid to lie down. She became haggard and exhausted but was unable to speak of her fears. Her breathlessness became extreme, and she listened to every breath she took. This struggle and the heavy sedation culminated in the episode of brief delirium for which psychiatric consultation was asked.

All barbiturates and bromides were stopped at once, and sodium chloride given. In their place a single dose of chloral hydrate was given at bedtime. But much more important, the patient was given strong reassurance about the nature of pleural effusion, and that she would not be drowned or suddenly suffocated by it. In addition, a night nurse was provided who did nothing but make sure that the windows and doors of the patient's room were kept open, and then sat and held the patient's hand until the patient fell off to sleep. This régime worked very well; the night nurse was dispensed with after a few days, and the chloral hydrate soon after.

It is of interest that the patient several months later ruptured her lung and developed a tension pneumothorax, but got through that frightening episode without extra aid, other than being returned to chloral hydrate at night for a week or so.

SUMMARY

Two illustrative cases are cited to call attention to a clinical picture of anxiety, restlessness, poor sleep, and great fear of suffocation in claustrophobic patients following thoracoplasty. They respond to this fear with rapid, shallow breathing, and pronounced irritative coughing. These patients appear to tolerate large actual encroachments on their breathing space badly, as if their previous symbolic fears were being realized. Treatment directed toward alleviating the tense emotional situation is effective in dispelling quickly the abnormal physiological response.

EDITORIAL NOTE

Dr. Jerome Hartz presents in his paper an interesting account of his observations on the emotional reactions of two patients subjected to thoracoplastic multiple state operations. His paper brings out clearly the imperative need for making an adequate personality study prior to operations, and particu-

larly emphasizes the significance of chest operations. The intimate connection between the deepest human anxieties and the functions of respiration and circulation is, of course, obvious, but this report indicates a field of great richness for the further exploration of the nature and inner meaning of these anxieties.

The common features shown in the two cases are first, a psychosexual immaturity with strong ambivalent feelings toward the mother, the resulting anxiety being expressed in claustrophobic symptoms; and second, a mounting anxiety upon repetition of operative procedures. These might be interpreted as a resultant of several etiological factors, including an increasing threat to the physical ego, prolonged

separation from security-giving relatives, and a decreased ability to experience symbolic passive gratification due to the obstruction to the intake of air.

It might be expected that the challenge of this paper to chest surgeons would increase their interest in seeking psychiatric consultations prior to operation in order that possible emotional trauma might be minimized and obstacles to rapid convalescence removed.—JOHN A. P. MILLET, M.D.

A PLEA FOR BOOKS

During the war the libraries of half the world were either destroyed or impoverished by isolation. The American Book Center for War Devastated Libraries, Inc., has come into being to meet their needs. It is collecting and shipping abroad authoritative books and periodicals which will be useful in research and necessary in the physical, economic, social, and industrial rehabilitation and reconstruction of Europe and the Far East. The American Book Center cannot purchase these; it must depend upon gifts.

What is needed: Shipping facilities are precious and demand that all materials be carefully selected. Emphasis is placed upon publications issued during the past decade, upon scholarly books which are important contributions to their field, upon periodicals (even incomplete volumes) of significance, upon fiction and non-fiction of distinction. All subjects—history, the social sciences, music, fine arts, literature, and especially the sciences and technologies—are wanted.

What is not needed: Textbooks, out-dated monographs, recreational reading, books for children and young people, light fiction, materials of purely local interest, popular magazines such as *Time*, *Life*, *National Geographic*, etc., popular non-fiction of little enduring significance such as Gunther's *Inside Europe*, Haliburton's *Royal Road to Romance*, etc. Only carefully selected federal and local documents are needed, and donors are requested to write directly to the Center with regard to specific documents.

How to ship: All shipments should be sent PREPAID via the cheapest means of transportation to THE AMERICAN BOOK CENTER, c/o THE LIBRARY OF CONGRESS, WASHINGTON 25, D. C. Although the Center hopes that donors will assume the costs of transportation of their materials to Washington, when this is not possible reimbursement will be made upon notification by card or letter of the amount due. THE CENTER CANNOT ACCEPT MATERIAL WHICH IS SENT COLLECT. Reimbursement cannot be made for packing or other charges beyond actual transportation. When possible, periodicals should be tied together by volume. It will be helpful if missing issues are noted on incomplete volumes.

THE RÔLE OF TRANSFERENCE IN THE TREATMENT OF A PATIENT WITH CONVERSION HYSTERIA

BEULAH BOSSELMAN, M.D.

The important part played by personal influence in the treatment of conversion hysteria is well known. It was the dramatic phenomenon of modification of conversion symptoms by authoritative demand which led such investigators as Bernheim and Janet to characterize the condition as a state of exaggerated suggestibility.

The miraculous "cures" which these men described are seldom observed now, largely because of the comparative rarity of this type of neurosis. One might stop to wonder whether this change is related to the modification of authoritative rôles in modern living. The patriarchal family, the pastor, schoolmaster and village doctor are no longer in evidence, and personal reactions are less categorically disciplined than before. Instead of the rather simple and direct repression of unacceptable drives as manifested in conversion hysteria symptoms, we see today the struggle expressed in diffuse anxiety states and neurotic character types.

No one will question the fact that conversion symptoms may be modified by direct influence of the therapist, nor will he dispute the scientific interest of this phenomenon. Cures brought about by hypnosis or other techniques of direct control are, however, notably unstable. This would be expected in view of the fact that the therapist has not, by these procedures, become a part of the patient's conflictual system but has only forced himself into a temporary rôle in that system. It seems logical that by psychoanalytic approach a more stable result should be achieved, insofar as the patient is able to establish a satisfactory transference. His analyst thereby participates in the struggle and exerts a meaningful—and therefore more permanently modifying influence on it.

The case of conversion hysteria to be presented is of interest because the symptoms lend themselves to direct observation and reflect in a comparatively simple way the vicissitudes of the transference situation.

The patient, Virginia, was admitted as a guest to the Illinois Neuro-Psychiatric Institute, Psychiatric Department, in August 1942. She was then 19 years old. Her symptoms consisted of marked contracture of the left leg with extreme weakness of the leg and a mild degree of muscular atrophy. The history of onset as given by herself was as follows:

When Virginia was between 12 and 13, she

noticed some pain in the left foot but did not pay much attention to it. That same year she began to menstruate and had severe nosebleeding. The following fall she experienced what she calls "getting a bug in my throat," with symptoms suggestive of globus hystericus. In February 1937, when she was almost 14, she was ill with high fever and delirium. She said she was dizzy and weak in both legs after that and had a slight pain in the left foot for a while. There were no further symptoms until a year later when Virginia began to have cramps in the left foot and to limp slightly. These symptoms continued, and in 1939 the contracture of the leg became apparent. She was taken to clinics and hospitals where the condition was believed to be poliomyelitis. In 1940 an orthopedic operation was performed and the leg was put in a cast. In 1941 she was brought to the Orthopedic Department of the Illinois Research Hospital. From there she was transferred in March 1942 to the Neurological Department and from there to Psychiatry in August 1942.

At this time the patient's left leg was drawn up so the heel touched the buttock. It could be forcibly straightened with difficulty. A strong tremor attended this process. The patient walked on crutches either with the leg drawn up or straightened and held in a brace. She never put any weight on the involved foot and resisted any attempts to persuade her to do so.

Virginia was a pretty girl who appeared much younger than her age and who dressed childishly. Her mother described her as always seeming young and as a very fearful, nervous, irritable child. She also emphasized her extreme modesty about sex.

Analytic therapy was begun in October 1942 under the supervision of Dr. Franz Alexander. It was continued with interruptions until March 1944. Once a positive transference was established, the patient began to show marked improvement which continued progressively though with some fluctuations for about a year. Circumstances then developed which interfered with her relationship with the analyst, and there was no further improvement in the condition of the leg. The gains established were not lost but the patient began to develop other somatic symptoms which culminated after discontinuation of the analysis in an appendectomy and the removal of an appendix described as normal.

No attempt will be made in this paper to analyze the processes involved in this girl's neurosis, though they are to some extent indirectly revealed. Emphasis, rather, is directed toward a correlation between the state of the analytic transference and the progress—favorable or unfavorable—of the symptoms.

At the time of the first interview, Virginia said, "The harder I try to straighten the leg, the more the muscles tighten up. It's always been that way." On October 9, she dreamed: "I was on a canvas stretched up high. At the other end was Miss N. (occupational therapist). She had something for me but I'd have to come and get it. I tried but the canvas tore and the weight of my body pulled me down. I clung to a rope at the edge and she helped me." "I really was sweating in that dream.—It's a hard struggle, but I'll make it." On October 11 she dreamed of being pursued by men who sprang out from behind trees. This dream led her to discuss her fear of men and to describe an incident which took place when she was 13. At that time, when she was practicing a dance, dressed in tights, her teacher, an older man, suddenly seized her in his arms. She told of the fear and repugnance she felt. This led her to discuss her anxiety and embarrassment about sex. The therapist from that time on encouraged such discussions and maintained a casual, reassuring attitude, giving such explanations as were indirectly requested. During this period, Virginia had several dreams of being pursued by snakes, bulls and men. On November 6 she remarked, "It seems to me that everything stopped when I was 13. I've missed so much those six years—in and out of hospitals, like a dream world."

"I still can't see how the leg is related to my fears. But the leg is getting a lot better; Miss J. (physiotherapist) can tell you that." Her report at this time was verified by the physiotherapist who reported noticeable improvement in the patient's ability to straighten the leg.

On November 18 she reported two dreams. "I had three snakes. I was playing with them. Mother came in and said she wanted to braid them. She did and put them on my head as a turban. I was terribly frightened and cried when she did. They were biting me. In the other dream I was playing the piano. Company came in, including a young man. He asked me for a date and I said all right. But after he left I thought I couldn't go through with it. I dressed up in an evening gown and went out into the woods. There were trees on both sides and it was beautiful. I parked the car and walked a long time till I came to a little church where I sat on the steps. Then the boy came and sat beside

me and kissed me. My thoughts were far away and I didn't pay much attention to the boy." She then remarked, "I was walking in the dream," and added, "I stood up alone for a second yesterday." The analyst congratulated Virginia on her progress, repeated her reassurances and then remarked, "But the snakes represent still your fear of the man's body coming too close—his penis like the snake." It was suggested that her fear was related to her anxiety about men's sexual organs, to which she replied evasively. She did, however, talk rather coquettishly about her preferences in men.

The next day Virginia did not appear for her interview and was reported to be in bed with suspected appendicitis. On the previous evening she had become nauseated and complained of abdominal pain. She insisted that she must have an operation or the appendix would burst. A surgical consultation revealed no organic signs of appendicitis. When the analyst visited her, she found the girl doubled up in bed, crying and trembling. The patient insisted that she was in severe pain. The analyst was sympathetic and showed her a good deal of attention but insisted that her disturbance was the result of emotional rather than physical difficulties. This Virginia denied vehemently, but nevertheless clung to the analyst.

The next week was a stormy period. She refused to eat, retained her urine for long periods, and at times became mute and rigid so that the nurses remarked that she seemed to be becoming catatonic. The analyst visited her every day, held her hand and encouraged her to talk, admitting having tried to push her too fast but insisting that they must continue to work on her problems.

One week after the upset Virginia returned for an analytic interview. The analyst observed that Virginia seemed rather disturbed and said, "You were beginning to improve and to feel more interest in sex and in things other young women are interested in; then you became frightened and ran away. Now you are wondering if you prefer to remain sick. Is that it?" Instead of answering, Virginia told the following dream: "I was coming from school, reading the poem 'Snowbound.' It was becoming dark. Someone behind me said, 'I'll get you.' I started to run the longest way home. The man caught up with me and stood in front of me and raised his knife. Just then a nurse appeared and the man brought the knife down and cut his own arm."

By the next hour Virginia was cheerful again and moved about with greater freedom. The improvement made in the leg was not lost. However, for

a few weeks her dreams were regressive, involving a return to her great-grandfather who had been a very protective person. When this also was pointed out to her as a running-away, Virginia said, "Yes, I guess that's right."

The next week Virginia walked noticeably better. Though she still used crutches and brace, she was more erect and used the leg more. Two days later she remarked, "I suppose you heard that I danced in O. T. today?" For the dances, she put her crutches aside, leaning on the men. She insisted, however, that she still disliked the contact with them. A few days later she remarked, "I've made a lot of progress lately; more than in all the time before." She reported a dream: "You and I were in riding outfits. You looked very nice. I was lacing my boot and you tried to hurry me. I got kind of nervous." At Christmas time Virginia gave the analyst a gift and expressed regret at the necessary break in the interviews. When she was seen again on January 4, she reported a dream: "I was in a large, dark, cold room, no furniture; a dirt floor. I tried and tried to get out—then I went to sleep. When I woke, I heard your voice saying, 'Don't be afraid—everything will be all right.' So I sat down and relaxed." Virginia told of having attended a Christmas party of boys and girls and said she handled it better than she had before. "But there were too many boys and too much mistletoe," she remarked, laughing.

At that time Virginia decided to return to high school classes at the orthopedic school and she became more interested and active in occupational therapy. The physiotherapist reported progressive improvement in Virginia's use of her leg. The contracture was diminishing and the muscles seemed stronger. During this active period, Virginia dreamed of being on a battlefield, carrying messages to the general but not knowing the nature of the messages. She remarked, "It seems like here—I take orders—messages—from nurses, doctors, you—yet I still don't know what it's about. I listen to what you say and I do it but it still isn't clear."

The patient's dream and her remarks seem to indicate the fact that progress at that point was based on transference rather than on any real insight. The fact that she was making an effort was indicated a few days later when she dreamed of being tied up in a room under a huge spider's web. A spider, carrying a little note, came nearer and nearer. Virginia tried to reach for the paper—finally got one hand free and then awoke.

About this time it became apparent that Virginia's relationship to the analyst, in spite of its

dynamic character, was not entirely satisfying to this very immature and demanding patient. She developed a friendship for one of the nurses who showed her a great deal of time and attention and thus apparently satisfied her needs for a more personal, protective relationship. On January 25 she related having dreamed that she was living with this nurse who was helping her learn to walk. When she could walk, they came to the analyst's office. Virginia let go of Miss X's hand and told the analyst she could walk. Then everyone crowded into the office. Virginia remarked that she had forgotten to tell this dream the week before. The analyst said, "You were afraid I wouldn't like it that she was helping to cure you?" Virginia denied this, saying, "No, when I could walk, I could hardly wait to come to you." The next hour she said, "I've needed a little bit of guiding that she gives. I need both of you." At this time she brought two dreams, in one of which a female patient whom Virginia disliked was dead; in the other Miss X was dead. These were interpreted as implying some hostility toward women, and the analyst attempted to encourage Virginia to express this in relation to herself. This Virginia would not do. However, her thought associations wandered to a general dislike of women, to remarks which a medical student made about psychiatry, and to discussion of brain disease with some implications of doubt as to her own diagnosis. Neither at this time nor during the ambivalent period which followed was it possible to get Virginia to express in any way frank hostility for the analyst, nor to recognize it when it was pointed out. She did become less productive, however, and finally admitted that she was hurt over having heard a staff member remark some time before that, "If Dr. B. can cure her, it will be a feather in her cap." The analyst remarked that it would be, in the sense of a good job well done, but reassured Virginia that she was nevertheless interested in her as a person and not just as a "case." Shortly after this she dreamed of receiving a telegram announcing her mother's death. She was encouraged to discuss her feelings, good and bad, for her mother but said, "I don't want to talk about her," and denied any connection of the dream with hostility to the analyst. She did, however, express anger at another woman staff member.

After this hour, on February 12, Virginia became ill with tonsillitis. The analyst visited her frequently, and once brought her some candy. Virginia remarked that when she got up from this illness she intended to discard her crutches. On February 17 she came to her analytic interview

without her crutches, leaning on the arm of an attendant and stepping fairly well in her brace. For several weeks Virginia alternated between periods of frank discussion and periods of resistance. She was repeatedly urged to put her feelings of hostility into words, but always denied having them. "When I like people I can't have any angry feelings about them." She was told that this tendency prevented her from having a frank relationship with her mother as well as with the analyst, and hindered progress. Virginia then talked of her resentment of people who thought she could get well if she wanted to and said, "You've helped me a lot to grow up but I still don't feel you are curing my leg. I've felt all along that some day I could walk." The analyst remarked, "You say you can't express resentment for me but when you don't give this treatment credit for your improvement, you are expressing deep resentment. Be free to talk about that." In spite of much encouragement, Virginia became upset and the next hour continued to apologize for her remarks. She then veered away from hostile attitudes and returned to the problems of her sexual fears. She became more flirtatious with men. She entered into active plans for leaving the hospital and attending school in the fall. A boy in the neighborhood became interested in her and asked her for her name. Virginia told him. The next day she seemed rather upset and remarked, "You should tell me when I do wrong things like that." That night she dreamed that the bricks had been torn out of the wall at her home. Her father was lying dead—shot, and she and her mother were crying. Someone remarked, "They should never have told her." Virginia admitted that her first ideas about the sexual behavior of her mother and father didn't seem right but said she hadn't understood them until recently. In the following interviews, she discussed her early concepts of pregnancy as brought about by a shot in the buttock which the mother gets from a doctor, and talked of her wish to be a boy and her rejection of menstruation.

During this period Virginia walked without crutches but only by supporting herself lightly by touching furniture or walls like a baby learning to walk. She refused to use a cane. Late in June she played ball on the lawn, standing without support, and stated, "I think I'll be walking by next month." Plans were made for her to go home for a visit and to spend some time at camp. She was told that she was expected to be able to walk without support by August 1 since she would then have to be coming downtown to visit the analyst instead of being seen at the hospital, and in September she was to leave the hospital and begin classes at Spaulding School.

On July 2 the physiotherapist reported that Virginia was able to put some weight on her leg without the brace for short periods. She was beginning to take a few steps without support except from the brace.

On August 10, 1943, Virginia made her first visit to the analyst's downtown office, coming alone on the elevated train, walking quite efficiently with her brace but without other support. She was quite irritable and depressed during this month, complaining of the hospital but expressing dissatisfaction with other placement plans. The United Charities had meanwhile accepted the problem of placing and supervising Virginia, agreeing to pay living expenses and to help her with practical problems of adjustment. They found a room for her in a girls' club to which she moved early in September. She did not like the room and complained a great deal, particularly of the boys who hung around and who often made advances to her. On September 8 she dreamed, "There was a little room off our bedroom. Two men came out and one had a glass with powdered stuff he made Mother drink. The other came to me with a knife and tried to stab me. The knife went through my hand. Then I got hold of it and killed him. I stuck the knife into his heart and cut his nose off. I cut him in two. Then Father was there. He and I and Mother went out into a boat and all three shot ourselves." Virginia remarked that if she ever did anything she shouldn't do she would shoot herself. The dream was interpreted as again reflecting her violent hatreds of which she is herself afraid. She expressed at this time some vague resentment that her father never visited her, and also hinted at his mistreatment of her mother, but refused to follow the subject further.

On September 13 she entered Spaulding High School. Then ensued an active period with close attention to her studies, regular visits to the analyst and an occasional "date" with a boy. She talked of her father, and expressed some fears related to him. At times she seemed to have insight into the relationship between her early home experiences and her fears and to see her symptoms as an expression of these fears. Late in September she brought the analyst a picture she had painted for her for a birthday present. On October 4 she attended a Northwestern University football game with one of the boys who was showing her much attention. The next day she said, "I didn't want to come in here today. I feel I'm taking up too much of your time." The analyst asked if Virginia resented going out with boys and felt she was being made to grow up too fast. She replied, "You've done a lot for me but I don't seem to have the will-power to do what I'm supposed to do. And then at school I need a

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guardian to sign papers and it ought to be the one I live with." Some time later, after some sailors had tried to enter the girls' club at night, Virginia dreamed of wild animals closing in on her. She said, "The fear is terrible. Sometimes I think you don't realize how bad it is." Shortly after this she dreamed of having her appendix removed. The analyst pointed out her identification of the appendix and leg and Virginia remarked, "Maybe if I had the leg off and the appendix out, I'd be all right." The analyst remarked that this indicated that she still hoped for someone to make her well, thus avoiding the difficult process of psychological readjustment.

At this time, a former nurse at the hospital invited Virginia to come and live with her. This older woman expressed a motherly interest in the girl and offered her a daughter's place in her home. Virginia expressed an intense desire to accept this offer, saying that she couldn't stand it at the girls' club any longer. The social worker from the United Charities therefore arranged with this nurse to pay her a regular fee for Virginia's board and room, and early in November she moved. At this time Virginia had been progressing well in her classes, going out with boys for bowling and to movies. Her walking showed slow progressive improvement. Although the placement was arranged on a businesslike basis, the nurse, Mrs. A., asked that Virginia call her Aunt Mamie and consider herself one of the family. They slept in a double bed together and Mrs. A. kissed Virginia goodnight and showed her a good deal of affection. On November 11 Virginia remarked, "I feel that most of my problems are over, now that I'm in that nice home and everyone is so nice to me." The analyst replied, "Being protected doesn't help to grow up, though. You must realize you have a lot of progress to make yet." Virginia said, "Yes, but I'll continue to grow up there. She is a lot like you in many ways."

Virginia made no further progress either in walking or in maturing emotionally after she went to live with Mrs. A. Almost at once she cut down her analytic hours from three to two per week and her attendance became irregular. It was obvious that Mrs. A. was discouraging her interest in the analysis and was at the same time giving her a great deal of attention, promising to put her through a nurse's course, to take her on a trip, etc. Virginia also began to express more frank hostility toward her parents and seldom wrote to them. About Christmas time, Mrs. A. began to criticize Virginia a great deal and to treat her with much less kindness.

Virginia reacted to this by initiating a series of illnesses and accidents. This, in turn, kept her away from the analyst and interfered with her progress in school. She developed in succession toothache, earache, bad colds. On March 2 the analyst received a letter from Mrs. A., stating that she wanted Virginia removed from her home. The next day Virginia came in with her hand in a bandage. She had fallen and cut it on some broken glass. She expressed ambivalent feelings for Mrs. A., alternately accusing and excusing her. She seemed confused by the change in Mrs. A.'s attitude. She remarked, "I know you told me at the beginning that it might be this way but I never believed it."

Virginia's hand became infected and she entered the surgical ward of the Illinois Research Hospital for removal of pieces of glass. While Virginia was there, Mrs. A. told the social worker that she wanted her to arrange another placement for Virginia. She did not visit Virginia in the hospital and it was necessary for the social worker to explain to the patient about the situation. During her period in the hospital Virginia expressed to the social worker hostility both for Mrs. A. and for the analyst. Her hostility toward the analyst related to the fact that the analyst insisted "there was nothing wrong with my leg." The analyst visited her twice, at which times Virginia clung to her hand, wept and seemed confused.

Retrospectively, it seems that during this ambivalent period the analyst might have reestablished the former close rapport with Virginia. Some factors which interfered with this were lack of time on the part of the analyst, plus a feeling of doubt that Virginia would ever be able to give up her dependent infantile strivings which led to such excessive and constant demands on a therapist. There was also Virginia's tendency to utilize the secondary gains of her illness, which made her regard the analyst with hostility, and to turn away from her so readily to anyone who seemed to offer more gratification.

Virginia left the hospital for a boarding home arranged for by the psychiatric social worker from United Charities. She almost immediately became ill, and during the spring months had one symptom after another. She fell and broke her brace, necessitating a temporary return to crutches while a new brace was being made. Her attendance at school was very irregular and she came so infrequently for analytic interviews that the analyst explained she would have to assign the hours to someone else. The climax was reached in another severe attack of so-called appendicitis. Her symptoms were suffi-

ciently severe that the physician who was summoned took her to Billings Hospital where an appendectomy was performed. During this illness, Virginia told the social worker she did not want the analyst to make any contact with the doctors at Billings because "if she does they'll think there's nothing wrong with me." The Billings staff, therefore, had no facts about Virginia's stay at the I.N.I. nor about her psychiatric treatment. A report from the hospital states the patient entered the hospital because of epigastric pain and vomiting of three days duration. She was found to have marked tenderness and rigidity of the right lower quadrant. Her temperature was 99.4 and her white count 7,700. It was thought that she probably had an acute appendicitis and an appendectomy was done. The appendix was grossly and microscopically normal and no pathology was found in the abdomen. She was seen in the Neurological Department where she gave a history of an acute febrile illness in 1937 followed by "neurological symptoms." The doctor states, "It was our impression that Miss — had had an acute encephalomyelitis of virus origin, probably not poliomyelitis, and that she now presents residual symptoms which will probably be permanent."

After Virginia left the hospital, she went home for a few weeks. The United Charities decided to continue to help Virginia after her return to the city, provided she was willing to do some part-time work. She returned in July and secured work coloring photographs. She called the analyst and a friendly conversation ensued. She said she could not get away from work for an interview then but did come to the office on August 4, 1944. She brought a large picture of herself for the analyst and remarked, "It was you I thought of all the time I was at home." Virginia, during all this period, had apparently continued to walk fairly well with the brace and there was no evidence of loss of the gains established. She said, "Did you know they said I had had polio?" The analyst stated that she knew there had been an organic diagnosis made but went on to state that it had been possible, nevertheless, to accomplish a great deal in the use of the leg and that progress was associated with confidence in the analyst and attainment of a better emotional

state. Virginia stated that, in spite of the diagnosis, she believed she could improve further. She related this dream:

"It was twilight; everything was pretty. Mrs. F. (her present landlady) was singing the song, 'Take my hand and follow me.' I took her hand, we went into woods along a grassy road. I became tired; sat on some steps and took off the brace. Then we went on; I without the brace. We came to some stairs leading to a pulpit. She told me I'd have to get up there and helped me start. When I got there I had on a nurse's uniform and was saying the Nightingale pledge. As I finished she closed the book." Virginia went on to talk of her plans for returning to school and later going into nurse's training. At the end of the hour, she remarked, "If Mother were here and I could talk to her, everything would be all right. I'm so lonely." Virginia was told that when she got her schedule arranged she could begin coming to see the analyst again. Up to the present, however, she has not done so.

The social worker reports that Virginia is doing well at school and is also continuing to work. She is less irritable than previously and seems to adapt herself better to her situation. Virginia herself in a recent letter to the analyst spoke of going out with boys and continues to express a hope to get into hospital work. She seems to use her leg about as efficiently as before.

It seems clear that the large secondary gain which this girl achieves from her illness can only be discarded when she is given a tremendous amount of protection, encouragement and affection. Her last dream brings this out most dramatically. Her ambivalence, however, makes it difficult for her to accept this protection with cooperation and insight. Her demands become excessive and when they are not gratified, the frustration intensifies the hostility. If Virginia could express this frankly to the therapist, she would indeed be allowing the therapist to play a dynamic rôle in the conflict. Up to now, Virginia has not dared to do this. Her recent experiences of rejection and of encouragement to illness add to her resistance and make the prognosis for further improvement rather unfavorable.

PSYCHIATRIC TRAINING IN THE FIRST YEAR OF MEDICINE

Dr. Douglas Bond, Professor of Psychiatry at Western Reserve University, has announced that first year medical students will be immediately introduced to the emotional problems of patients. He says: "We felt it was most important to get in some feeling for people as early as the microscope is introduced and our intention is to talk chiefly about emotional living with the superficial presentation of a few patients and some discussion of war neuroses. Approximately twenty hours will be devoted to this in the first year."

URINARY HESITANCY

A CASE REPORT ILLUSTRATING A PSYCHOSOMATIC PROBLEM

DON E. JOHNSON, Lt.(jg)(M.C.)S, U.S.N.R.

R. N. M., a 25-year-old sergeant of the United States Marine Corps, was admitted to a Station Hospital in the Pacific Theatre for neuropsychiatric observation.

Chief complaints were headaches, ringing in right ear, weight loss, insomnia, weakness, and nervousness.

He dated his *present illness* to about three months prior to his admission to the sick list; it began gradually while he was stationed in Hawaii, a few weeks following conclusion of his last campaign. He had served five years and two months in the Marine Corps, nineteen months overseas, and had seen strenuous combat action on three different occasions, usually as the leader of a machine gun squad. He had received a machine gun bullet wound of the left parietal scalp. He was recipient of the Purple Heart, in addition to two Presidential Unit Citations. He volunteered for and served in a paratroop unit until it was disbanded. His disciplinary record was spotless; from all standpoints, he was considered a valuable member of an outstanding organization. He failed to see any connection between his combat experiences and his anxiety symptoms, and believed they were only related temporally.

During his overseas hospitalization, his subjective feeling of tension pursued a rather flat course, and he was evacuated to a hospital in the continental United States under diagnosis of psychoneurosis, anxiety neurosis. Although he had been examined by and had talked to several physicians previously, it was not until his admission to this hospital that he began talking of what he thought to be the reason for his cumulating tension.

Family history showed the patient to be the fifth of eleven siblings. His parents were Russian born, and lived in a Pennsylvania mining town where the father provided an inadequate living for his family by his work as an unskilled laborer. For seven years his mother has been continuously hospitalized for a psychosis of unknown type. The father was described as ignorant, tyrannical and temperamental. His five brothers and five sisters were not remarkable.

Past history revealed a childhood and adolescence spent in marginal socio-economic circumstances, which he nevertheless regarded as happy. He com-

pleted the ninth grade at age 16, when he decided it was time he began making his own living. He had what he called a "nervous breakdown" at age 18, consisting of moderate anxiety, restlessness and insomnia, which disabled him for work for about one month. This occurred without known precipitating cause. After several jobs of a diverse nature, he entered the Marine Corps at age 20, intending to make it his career. He suffered uncomplicated gonorrhea at age 24. He had never smoked and drank only socially.

Urinary hesitancy, which he considered to be the primary source of his tension state, had existed in some degree since age 7. He was more or less regularly unable to urinate in the presence of others, particularly adults. For eighteen years, the symptom had not been absent for more than a few weeks at a time. The symptom varied in degree so that at times he was unable to urinate while alone, or the initiation of the stream was delayed up to as long as several minutes. It had frequently been the source of great embarrassment to him, and he felt that it had seriously hampered his Marine Corps career.

Physical examination revealed weight loss of 30 lbs. from his usual weight, impaired hearing in the right ear due to noise trauma, and excessive perspiration and peeling of the palms. Neurological and indicated laboratory studies were essentially normal. Consultation revealed no evidence of genito-urinary pathology and no treatment was suggested for his distressing symptom.

Mental examination revealed a neat, cooperative, pleasant sergeant, who sincerely desired aid for his anxiety symptoms. He was quiet, soft spoken, somewhat self-conscious, and noted mild feelings of inferiority. His responses to questions were somewhat delayed but well formulated and showed that he had done a great deal of intelligent thinking about his problem. He was ashamed of his symptom, which he considered "abnormal," and took steps when possible to see that others did not recognize it. Except for the Marine Corps, he had no definite interest or plan for the future. In contrast to his former enthusiasm about the service he stated, "This has taken the desire for anything out of me." His anxiety was predominantly subjective.

Impression: There seemed good reason to believe

that this patient's anxiety symptoms existed in a more or less cause-and-effect relationship with his urinary hesitancy. In the short time available, in order to learn more about the precise etiology of the urinary disturbance, a direct attack was instigated. With excellent cooperation, a series of hypnotic interviews were conducted during a period of three weeks (the first with the aid of three gr. sodium amytal orally one hour prior to induction). The highlights of these sessions follow:

- I. "It isn't right, should be natural. Always a handicap to me. Started at school one day, then I just couldn't do it when others were around.
- II. "I could have been shy; someone might have told me it was not right to do it in front of others. Something always stopped me when I tried. Probably was physically ashamed at some time—just grew up that way. . . . Someone's threatening. Someone told me not to do it somewhere. Some kind of violence, someone threatening to cut it off."
- III. Patient reported that he had seemed more fatigued and restless during past few days. Two dreams: one in which a group of people were preparing to shoot an injured horse with pistols, the other in which the patient was sending a semaphore signal to another man as he walked along on an island. "Someone is threatening me again. (Restless). Someone has a knife in his hand; they are pounding on the table with a knife; seems like I have done something. The man is drunk, whoever he is. (It is so far away—coming closer). Maybe I was imagining something when I was a kid; someone was going to carry out the threat they made. Just a hope they didn't carry it out. Dread. Cut penis off. (Much restlessness and sighing). If I keep it up, they are going to cut it off—keep something you—don't know what—a habit they wanted to break. Seemed like I stopped that habit—forced myself to stop it. Habit—was urinating in bed at night. One older, me, one younger brother all had urinating in bed trouble; I was first to stop it. Younger brother—could walk—no bottle—talk only a little—between one and 2 years old (making patient at this time between 2 and 3 years). House full of people—all telling us—threatening us. Seemed like if I stopped natural, I would not have this trouble. A stupid trick. Was able to stop because of concentrating on stopping and

did. *Closed mind against doing it in the bed.* Feared that something was wrong ever since then—seemed like the inside was not right anymore. A shame there after that; they shamed or threatened me out of it. Now I think it is childish; instead of fighting it, I should have let it be natural. Father—drank a great deal. I seem to be thinking of him too much—wonder if he threatened me when he was drunk? Now I seem to be getting someplace."

- IV. "Seemed like I have been stopped somewhere, somehow. Doesn't seem right, some kind of thought I had a long time ago, a fear. Dread that someone should hurt me, didn't want it to happen. Fear of threat carried out." Dream: "I received a Christmas package; some of it was missing, the package was torn."

Following this session, the patient reported feeling "very much more relaxed." He reported great improvement in his urinating, and wondered if the improvement would continue. Coincidentally, a rather remarkable change was noted in his everyday behavior; he was changed from a quiet, unassuming, passively cooperative patient, to an alert, witty, happy-go-lucky leader of ward activities. His physical improvement lasted only about three days, but his favorable personality change continued. Overperspiration of his palms had ceased.

- V. "Seemed to come on at certain times, at first—no trouble in between times. At certain times—when someone older than me was around—just an adult. Must have gotten the idea you shouldn't do it in front of adults. I am thinking of my father. It looks wrong, incorrect. He used to tell us not to expose ourselves. Seemed like to him it wasn't right. Should be done in private. Seems like a son shouldn't look on his father and vice-versa, he said. Must have made me shy, but stopping must have been because of threatening earlier."

One month after discontinuing the hypnotic sessions, just prior to the patient's leaving the hospital, he reported "considerable improvement" in his symptom of hesitancy. This had come about gradually, not in response to suggestion, but, he believed, due to his better understanding of the symptom. He was appreciative, optimistic about the future, and his pleasant, engaging manner was still in evidence. He felt that, for the first time in his life, he was assuming life on an equal plane with other men.

COMMENT

Functional urinary hesitancy exists rather commonly, usually as a non-disabling, transient, minor symptom. Since it is known as such, most clinicians have either successfully ignored it, or have convinced their patients that it is an irremedial defect of their urinary apparatus, "constitution" or personality. Modern textbooks of urology scarcely mention the subject; there is a similar dearth of pertinent information in the journal literature.

Men of the Armed Forces have perforce altered their emunctory habits, sometimes with the formation of distressing symptoms. A case is presented in which the symptom urinary hesitancy and a disabling anxiety state were interrelated. A brief period of treatment by hypnosis revealed what seemed to be at least a part of its etiology and influenced the symptom favorably. Coincident with the patient's recall of certain past events, a rather remarkable amelioration of his anxiety occurred.

It is probable that the anxiety which the patient ascribed to his urinary hesitancy was in fact part of the deep castration anxiety which led to the micturary inhibition originally; with longer study, no doubt other manifestations of this anxiety would have become apparent. The psychopathology of his present illness anxiety would appear to have been the frequently reduplicated castration fear, based on an overt childhood castration threat. It is perhaps worthy of note that through rather superficial therapy, such deep personality layers were touched that a life-long psychosomatic symptom was favorably influenced.

SUMMARY

A case of urinary hesitancy is presented. The symptom, together with the accompanying anxiety state, was favorably influenced during several hypnotic sessions, which revealed at least a part of the psychopathology involved. The pathology consisted of a castration fear based on an overt childhood castration threat.

VETERANS ADMINISTRATION NEUROPSYCHIATRIC SERVICE

The Veterans Administration is offering opportunity for the training in and the practice of psychiatry. Teachers for hospitals and medical schools, men of all types of experience who can benefit from training on the job, organizers and administrators of hospitals and clinics are needed, as are residents who may have had little or no formal training in psychiatry but who intend to complete their training for Board certification and to stay in neuropsychiatry.

Salaries range from \$3,300 for the Resident, who is a veteran, to \$9,800, with 25% additional for those who have Board certification. Every effort is being made to organize the work so that a minimum of time will be spent on administrative duties and paper work, and the maximum with the patient.

The resident program is outlined as follows: 1. Appointment approved by Deans' Committee. Approval forwarded by Deans' Committee to Manager. Manager makes appointment. Resident placed on payroll at Manager's Office. 2. Fifty per cent of time of resident spent with Veterans Administration facilities. 3. Veterans Administration doctors to share in training without loss of grade when time and staff capacity permits. 4. Medical Schools or other sponsors of trainees to receive appropriate tuition per resident on a yearly basis. 5. Teachers to be recompensed in the following: a. Consultants (men of professorial, associate or assistant professorial grade) to receive \$50.00 per visit; b. Attending physicians (men with specialty Board certification and on the teaching staffs of institutions) to receive up to \$25.00 a visit.

Specific details on the entire Neuropsychiatric Program can be obtained by writing to the Veterans Administration Neuropsychiatric Service, Washington 25, D. C. The full list of medical schools now receiving applications for residents can be obtained by writing either to the Veterans Administration Neuropsychiatric Service or to PSYCHOSOMATIC MEDICINE.

REVIEWS OF PERIODICAL LITERATURE

SARGENT, MORGAN: *Psychosomatic Backache*. New Eng. J. Med., 234:427, 1946.

"Much more study has been concerned with cases where some pathologic condition could be found than with those where no disease or deformity can be found." In this paper it is suggested that the differential diagnosis of backache is incomplete without the consideration of psychogenic factors, for the latter are important not only as causes but also as contributing factors in cases of organic disease.

In an Army Air Force convalescent hospital, with the primary mission that of treating severe anxiety states, there was an unusual opportunity to see a large number of patients suffering from neurotic symptoms and incidentally complaining of backache. They fell, with considerable overlapping, into three groups: first, those with definite organic disease (organic disease alone in only 4 per cent). The second group was that of hysterical conversion symptoms. Few, if any, patients of this group were thought to have symptoms of a purely hysterical conversion. In practically all of them there was a history of some previous injury to the back, often incurred many years previously. On even superficial psychiatric examination the men whose backache was considered a conversion symptom showed comparatively less overt anxiety and nervousness.

The largest group was the third, cases which are considered functional in type. The backache was due to muscular tension, the somatic manifestation of increased nervous tension. In these patients all the symptoms were found associated with operational fatigue. The backache was usually intermittent and was most frequently complained of at night and after exercise. In severe cases the muscular tension was demonstrable by palpation, sometimes even fibrillary contractions were visible. The signs and symptoms often varied from day to day in the same patient, as may be expected if the muscular tension is the result of nervous tension. In this group the patients complained of a rather diffuse pain, in contrast to the other groups. In many cases the pain was similar to that of protective muscle spasm in injuries of the lower back.

The treatment consisted, in many cases, of simple psychotherapy. It was explained to the patient, who was told how his nervous tension caused muscular tension and how his anxiety dreams prevented him from relaxing at night. These simple explanations often had a beneficial effect on the patient but in any case paved the way for more intensive psychotherapy directed to the underlying anxiety state.

In the group with conversion backache medical measures often focussed the patients' attention on the symptoms and caused them to become even more fixed. (O. P.)

LUCK, VERNON J.: *Psychosomatic Problems in Military Orthopaedic Surgery*. J. Bone and Joint Surg., 28: 213, 1946.

The author, an air corps orthopedist, states: "Orthopaedic surgeons, as well as other clinical specialists, have come to the realization that there is a psychiatric aspect to their specialty which they can neither ignore nor deal with merely by intuition. Many have been so fascinated by the physical phase of the work that too little recognition has been given to psychosomatic problems—even to the extent of carrying out heroic operative procedures upon neurotic patients. . . . A psychosomatic diagnosis must be based upon what the patient has, and not alone upon what he has not. . . . We now recognize that, if musculoskeletal symptoms of psychogenic origin are identified, our responsibility to the patient does not always end when we have found that there is no organic lesion."

Approximately 1000 patients with psychogenic musculoskeletal symptoms were studied. Of all the patients hospitalized on the author's orthopedic section during 1943, 11.1 per cent had "outstanding psychologic problems which were either the sole cause, or the most important contributing cause, of their disabilities." Of orthopedic out-patients the same year, over 25 per cent fell in the "predominantly psychogenic" class.

Three types of psychologic problems were regularly encountered: 1) those in which no relevant past or present organic lesion could be uncovered, 2) those secondary to organic lesions, and 3) those perpetuating some symptoms of a healed organic lesion. Psychiatrically the cases were conversion reactions, anxiety or tension states, and "psychogenic elaborations of symptoms from an organic lesion." Mixed types were more common than pure ones.

An abbreviated psychologic history was taken with the regular clinical history, the author feeling that in most instances it gave sufficient information for adequate evaluation.

Psychogenic musculoskeletal pain: "It is enlightening, and most helpful from the standpoint of diagnosis, to persuade the neurotic patient to describe his symptoms accurately. At the outset he usually describes his physical distress merely as a pain. . . . What the neurotic individual describes as pain in the joints or in other regions may be discovered, upon further questioning, to be a feeling of tension or of pressure. The region may feel tight and the tension may increase steadily when the part is kept in one position. . . . The focus of psychogenic distress may feel as though a great weight were upon it, and as though the area were intensely fatigued. Peculiar and bizarre postures may be assumed. . . . There is no position of complete relief, and no relief is obtained from immobilization. In a normal-appearing joint, a psycho-

genic factor should be suspected when a disabling pain is not influenced by motion or rest of the joint. . . . Pain radiating from a distal point proximally is far more likely to be of functional origin than pain which radiates distalward."

Circumferential hypalgesia: The site of musculoskeletal symptoms did not often dictate the pattern of hypalgesia. Patterns of 100 consecutive cases of diminished pain sensitivity are presented.

Treatment: For a large group of patients, the author states, the orthopedic surgeon will have to assume responsibility for psychotherapy. This will be of the minor variety, including correction of environmental conflicts, facilitation of insight into the psychologic symptoms, explanation of any coexistent organic symptoms, elimination of underlying conflicts when possible, elimination of aggravating factors, and prescription of sedatives and other adjuncts. Fourteen cases are briefly outlined. (L. P.)

BARAHAL, HYMAN S., AND FREEMAN, NATHAN: *Sudden Graying of Hair, Alopecia, and Diabetes Mellitus of Psychogenic Origin. Psychiat. Quart.*, 20:31, 1946.

Unusual, sudden bodily changes in a 38-year-old white soldier under emotional stress are described.

Family history: His father was an excessive drinker until recently. His mother has hypertension and syncope. A brother, 36, the only sibling, had some premature graying around the temples occurring over a four year period and supposed to have been due to working in excessive heat for a long time. There was no history of diabetes.

Past history: Besides the usual childhood diseases there was diphtheria and acute rheumatic fever. The patient left high school at 16. He was shy, timid, well-liked, and excellent in deportment.

He described himself as always being nervous and constantly on the go. As a youth he participated in sports excessively; later he worked overindulgently.

In ten years he worked himself up from clerk to assistant supervisor. The firm closed, and after being dejected several months he took a low-paying job in which he gradually advanced himself in the ten years prior to induction.

He refrained from intercourse before he was married, at 21, to a girl of 17. There was constant bickering and a two year separation ensued. During this time the patient was "angry at the world," had periods of depression, seclusion and excessive work alternating with periods of elation, drinking and social activity. After a reconciliation he and his wife became intensely attached.

To induction he reacted with a strong sense of duty, a dread of risking his marital and economic security, and a fear of physical danger. He found it difficult to accustom himself to military life. He tired easily, had frequent dizzy spells, anxiety, insomnia, and palpitation—an aggravation of life-long symptoms.

Present illness: In North Africa during December, 1943, after seven months' service, he developed a sudden sharp pain in his left chest and fainted following a three mile hike. "He was seen shortly afterward by the dispensary physician who found no organic disease (after tests which included a negative urine examination), and he was returned to duty.

"During that same night this soldier was very restless, tense, and greatly perturbed over his future and the separation from his wife. He was unable to sleep and felt that he was on the verge of a 'nervous breakdown.' The following morning he was astounded to find that his capital hair, which had previously been dark brown, had turned white, with the exception of several dark strands. Within the next few days there occurred a considerable loss of frontal, marginal, and facial hair. He remained on duty and two weeks later reached India.

"While stationed in the jungle this fear almost reached the proportions of a panic state; and within a few days he began to complain of a 'sugary taste' on his lips.

"However he did not seek medical attention until March 12, 1944, when he was admitted to the station hospital, Calcutta, with complaints of urinal frequency, nocturia, loss of appetite, weakness and a 30-pound weight loss over one month. A diagnosis of diabetes mellitus was made, but the laboratory findings were not forwarded when the patient was transferred to the zone of interior and hospitalized. . . . Twelve consecutive glucose tolerance tests and urine examination failed to reveal the presence of diabetes, and he was discharged to duty June 14, 1944."

Two months later he was assigned to a job handling prisoners and his previous complaints recurred almost immediately, so he was rehospitalized. Glucose tolerance and urine tests yielded results varying from "practically normal to levels suggesting a severe diabetes." Dosage of insulin could not be determined. The patient was stabilized on a regular diet sans insulin and given a disability discharge. Deep analytic studies were not possible.

Discussion: Alopecia—"Alopecia areata is universally accepted as being of psychogenic origin, even by non-psychiatrists."

Sudden graying—"Despite the skepticism frequently expressed as to the physical possibility of such an occurrence, there can be little question as to the scientific authenticity of some of the reports. . . . It would appear physically inconceivable that the hair pigment can disappear so abruptly . . . such a concept is not necessary. It has been shown that the color of hair depends not only on its pigment content but on the manner in which it reflects light as well. An opacity or fragmentation of the hair cortex or the sudden introduction of microscopic air bubbles may produce a gray reflex in the presence of the original pigment. Such gaseous bubbles have previously been reported and explained by the fact that emotional states such

as shock, rage or fear, produce histamine-like substances in the skin with a subsequent lowering of the surface tension of the fluid in the hair shaft, producing a release of gaseous bubbles similar to the process in 'bends.'

Individuals subject to premature or sudden graying conform closely to the anal erotic personality.

Psychogenic diabetes—Sudden onset of diabetic symptoms under emotional stress, and their subsequent fluctuations with evaluational responses to situational changes "speak quite conclusively for at least a psychogenically influenced, if not psychogenically caused, diabetes."

In conclusion the authors feel one can only surmise the mechanisms involved in this case, but they cite the fact of "strong evidence in support of the view that the hypothalamus serves as the relay center for the conversion of emotional impulses into vegetative and endocrinological effects." (L. P.)

DAVIS, DAVID B., AND BICK, JOHN W., JR.: *Skin Reactions Observed under Wartime Stress*. J. Nerv. and Ment. Dis., 103:503, 1946.

"In recent years attention has been devoted to various ways in which the human tegumentary system reacts to various psychobiological conflicts . . . the problem of classification [has been clarified] by dividing all dermatological conditions into two varieties, namely, skin diseases and skin reactions. In the former a specific etiologic agent is believed to be always responsible, while in the latter it is believed that the skin is reacting to an unfavorable emotional experience."

Eczema: "In the physiological reactions of normal mood swings, the skin reacts with flushing, pallor or sweating, the degree depending upon the individual and the setting. In the same manner that anxiety is a quantitative exaggeration of mild tension or 'nervousness,' so atopic dermatitis is a quantitative exaggeration of a mild skin reaction; an additional symptom of an anxiety state occurring in a sensitive individual whose anxiety is reflected through the skin." Three cases are presented.

Hyperhidrosis: "Hyperhidrosis of the feet often results in a skin condition which leads the unwary to think he is dealing with a fungus infection. With no improvement following local therapy further observation reveals excessive sweating of the axillae and hands as well as of the feet. Psychiatric study in these patients will usually reveal tenseness, tremors and other evidences of anxiety . . . a definite relationship was observed between periods of exacerbation of the hyperhidrosis and some stress-producing incident. Restlessness, undue sensitivity and resentment were the principal personality features noted." One case is presented.

Urticaria: "Patients with urticaria did not reveal the relationships between skin lesions and the personality problems that have been noted in the two previous groups. . . . Efforts at creating a stress-producing situation in these patients failed to produce a recurrence

of urticarial symptoms although personality problems existed and were of the anxiety reaction type." (L. P.)

SAMPIMON, R. L. H., AND WOODRUFF, M. F. A.: *Some Observations Concerning the Use of Hypnosis as a Substitute for Anesthesia*. Med. J. Aust., 33:393, 1946.

In a Japanese prisoner of war hospital in the Singapore area it was necessary to resort to hypnosis as a substitute for anesthesia, because of the extreme scarcity of anesthetics. In this paper an account is given of 29 cases. Although the method was enforced by circumstances one may reasonably hope never to encounter again, it was found to possess certain advantages which may justify its use in selected cases in ordinary surgical practice. The advantages are the following:

1. Nervousness of the patient is entirely eliminated.
2. Full cooperation of the patient can be secured.
3. Post-operative pain can be reduced to a minimum, and even, in many cases, prevented altogether.
4. The usual complications of other forms of anesthesia, including postoperative vomiting, do not occur.
5. In dental cases there appears to be less hemorrhage and more rapid healing.
6. The method may be used in certain cases where ordinary anesthetics cannot be used or are contraindicated.

The technique employed was that of convergence fatigue. The patient was in supine position and instructed to gaze at the point of a pencil held at the minimum distance of distinct vision. An attempt was made to induce deep sleep. Suggestion, mainly concerned with the production of anesthesia, was given. In addition it was suggested that there would be no pain after the operation.

It was easier to induce hypnosis in reasonably intelligent patients. There was no significant difference between patients of different races.

While the induction of deep hypnosis was always attempted, in some cases even suggestion without true hypnosis gave satisfactory results.

There were three complete failures in the series: two of the patients suffered from eye disturbances, the one was a hypermetrope and the other asthenopic. The third patient was deaf, which was not recognized at the time. (O. P.)

FRANK, LAWRENCE K.: *Gerontology*. J. Gerontol., 1:1, 1946.

With millions of men and women growing older, baffled by changes in themselves and in the world around them, the country has a definite need for not only large scale provisions for their care but also for a specific and individual service for each one. Against the present, almost brutal neglect of the aged, by which many have been misused, we need a national policy to guide our social, political and economic activities toward the aged.

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major problem of preventing wastage of human resources and of increasing human conservation. The *Journal of Gerontology*, the first journal in the field, will provide a medium of communication and of interpretation in our effort to gain more and surer knowledge of human growth and development. For all the problems of aging we must have more research, more explorations in health care, more guidance for the aged, and we must incorporate this knowledge into our various organizations and services to protect and conserve all members of society. (Author's abstr.)

[The *Journal of Gerontology* is a new quarterly published for the Gerontological Society, Inc., by Charles C. Thomas, Springfield, Illinois. It contains articles on the problems of aging from the fields of the biologic and social sciences. Each article is abstracted in English, French, Spanish, and Russian. There are also reviews and abstracts. A separate, smaller, non-technical supplement of each issue is also published. This contains digests of all *Journal* articles and is written in everyday language. Each digest is approved by the original author; some contain additional background material. The supplement also has a glossary of scientific terms. Dr. Robert A. Moore is editor-in-chief and is assisted by an advisory editorial board of specialists in the biologic, medical and social sciences. (L. P.)]

EYSENCK, MARGARET D.: *The Psychological Aspects of Ageing and Senility*. J. Ment. Sci., 92:171, 1946.

Strictly speaking, to say that a certain change is due to age, or takes place with advancing age, would make it incumbent upon us to show, first, that the quality we are studying is present in the same individual at an early age and absent at a later age, or vice versa; and secondly, that this change cannot be accounted for by any other cause except advancing age. Not a single one of the 250 or so studies hitherto conducted fulfills these conditions . . . the main facts which emerge from the literature [78 references] [are] the differential decline at a positively accelerated rate of mental, perceptual and motor abilities, from a peak period in the early twenties, and a general withdrawal of libido from the outer world concomitant with this mental decline. (Author's summary.)

GOLDSCHMIDT, H.: *Social Aspects of Ageing and Senility*. J. Ment. Sci., 92:182, 1946.

Four groups of 50 aged in four different settings were studied via social histories to see whether—apart from organic cerebral changes incident to old age—social influences operate which are directly related to senility and senile psychoses.

Lack of social integration—normal human contacts and the feeling of being a useful member of society—was “most powerfully averse” to mental health. An advisory center for the aged—along the lines of a child guidance clinic—was envisaged. (L. P.)

SPIES, TOM D., AND COLLINS, HARVEY S.: *Observations on Aging in Nutritionally Deficient Persons*. J. Gerontol., 1:33, 1946.

Various conditions brought on by lack of proper nutrition have been variously judged to be simply a part of growing old, or to have an effect of making a person appear old beyond his years. This is particularly evident in southern United States. . . . As a result of a study made over a period of ten years at the nutrition clinic, Birmingham, Alabama, it was found that nutritional deficiency is most common among women of childbearing age. These women frequently have inadequate diets during pregnancy and as a result both mother and child are affected.

Of the cases observed at the clinic, most of the women suffered from pellagra, nervousness and hallucinations, sore mouth and tongue, severe pains in the feet and legs, and loss of weight. One woman of 30 was judged by her appearance to be 50. Another who was 70 began again to lead a vigorous and happy life after proper diet and treatment were prescribed. No one knows what role nutritive failure plays in the aging process, but a greater effort should be made to apply what we know so that older people suffering from lack of proper nutrition may be returned to an active and happy life. (Authors' abstr.)

LEVIN, MAX: “Delay” (Pavlov) in Human Physiology: Sleepiness on Delayed Response to Stimuli. Am. J. Psychiat., 102:483, 1946.

When a person, eager to give expression to an impulse, restrains himself till an opportune moment (for example, a runner awaiting the start of a race), one is dealing with an experiment of nature which duplicates, in principle, Pavlov's experiments on “delay.” Excitations are roused by a conditioned stimulus but are held in check by inhibitions pending arrival of the proper moment.

The sleepiness which man and lower animal alike sometimes show under these conditions signifies that the inhibitions have, so to speak, overshot the mark and have irradiated widely over the cerebral cortex. (Author's summary.)

CLARK, PAUL C.: *Psychosomatic Problems as Seen in Internal Medicine*. Psychiat. Quart., 20:113, 1946.

Five cases exemplify the necessity of observing sociologic, physiologic and psychologic factors as they effect the patient as a person.

Case 1 was a woman whose subacute bacterial endocarditis was remitted under penicillin. She knew all her life that she had a heart lesion, but apparently was not concerned about it. She carried on unchanged after her illness.

The next case was an 18-year-old student who had never run or played since childhood, after a physician said she had a weak heart. Her heart was intact. After considerable persuasion and a close attachment to her

physicians she entered a program of graduated exercises and began to lead a more normal life.

Case 3 represented a man with compensated heart disease who elected—after a two year illness—to retire with a disability benefit, although his physician felt he could continue on the job. His wife was an oversolicitous, apprehensive woman who catered to his every whim.

Case 4 was a 70-year-old woman who died in a state of anasarca due to hypoproteinemia. For many years she ate only cereal, refusing protein and other solid food. She dominated her family and would not cooperate with her physician.

The last case was an aged spinster who conserved her bank balance by eating very little, so that she was malnourished. She developed low back pain, for which no structural cause could be found, after the death of her mother. She had attacks of diarrhea whenever her three brothers, who did not share in the mother's estate, were not attentive to her. (L. P.)

KRAUSS, STEPHEN: *Post-Choreic Personality and Neurosis*. J. Ment. Sci., 92:75, 1946.

A series of 28 post-choreic persons (23 military, 5 civilian) who developed neurosis were examined. . . . Five distinct groups of abnormalities (hyperkinetic, neurasthenic, psychasthenic, characterological, temperamental) were found, which regularly form a characteristic "post-choreic syndrome." These symptoms are present both in non-neurotic and in neurotic post-choreics, but they tend to develop more grossly in the latter.

These post-choreic abnormalities facilitate the development of neurosis. Brought under unusual stress, post-choreics are unable to adapt themselves to the situation, and get overwhelmed by their somatic and environmental difficulties and emotional conflicts.

Hereditary factors predisposing the brain are found running in the families of children who acquire chorea. . . . Prophylactic measures [sulfonamide and luminal] are proposed. (Author's summary.)

GUTTMANN, E.: *Late Effects of Closed Head Injuries: Psychiatric Observations*. J. Ment. Sci., 92:1, 1946.

Prolonged after-effects after non-operative injuries occur in about 20 or 30 per cent of cases . . . constitutional predisposition [signs of mental instability in the personal history or a family history of serious mental disorder] is an important contributory factor in their etiology; others are psychological and environmental stress. In that respect the chronic cases do not differ much from neurotics, though their predisposition is slightly less, their symptomatology slightly different. The prognosis is very similar. The psychological and social factors, susceptible to treatment and environmental manipulation, are of the greatest practical importance. (Author's summary.)

BRILL, A. A.: *Phyletic Manifestations and Reversions*. Psychiat. Quart., 20:3, 1946.

The author has "no doubt that some mental manifestations show a direct transition from the unconscious present to the primordial past. For if we agree with the biologists that ontogeny is a recapitulation, or at least an epitome of phylogeny, it is not unreasonable to assume that present-day behavior is *mutatis mutandis* a continuation of the past."

The pleasure which is ontogenetically inherent in the anus came originally from the cloaca. This underwent complicated changes—micturation and generation were diverted into separate channels, and defecation and flatus continued and were endowed with disgust in the course of cultural repression. But "some of its former activities unconsciously strive to assert themselves, and the popular request to kiss or suck the posterior seem to be . . . an ecphoriation of phyletic engrams in distorted form."

A couple who constantly quarreled and yelled anal expletives at each other could not be fully explained by ordinary psychoanalytic methods.

Other aspects of anal eroticism, some psychotic behavior, expressions of some idiots, and the Lawrence-Moon-Biedl syndrome "forcibly suggest phylogenous origins." (L. P.)

GRINKER, ROY R., WILLERMAN, BENJAMIN, BRADLEY, ARTHUR D., AND FASTOVSKY, ASHLEY: *A Study of Psychological Predisposition to the Development of Operational Fatigue. II. In Enlisted Flying Personnel*. Am. J. Orthopsychiat., 16:207, 1946.

A structured questionnaire interview was administered to 198 hospitalized enlisted airmen suffering from operational fatigue, and to 171 controls.

Patients were predisposed by these factors: parental discord and separation, parental alcoholism, less interest in sports, greater frequency of childhood neurotic traits, greater dependence on home and mother, greater reaction to disturbing life situations. Prevalence of these factors was statistically linked with severity of operational fatigue symptoms.

Patients had more unexplained illnesses, more bad dreams, poorer sleep, and evidenced their poorer adjustment in other ways overseas. (L. P.)

TEICHER, JOSEPH D.: *Environment—An Adjunct in Treatment of Combat Fatigue*. Am. J. Psychiat., 102:460, 1946.

If a modicum of individual treatment is provided by an initial comprehensive and intensive interview and by infrequent (monthly) follow-up sessions, combat-induced emotional disorders will respond in an ordered stable environment without special psychiatric treatment and without group therapy, other than that afforded by group activities. Five cases are presented from a naval disciplinary installation. (L. P.)

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SAUL, LEON J., ROME, HOWARD, AND LEUSER, EDWIN: *Desensitization of Combat Fatigue Patients*. Am. J. Psychiat., 102:476, 1946.

As an adjunct in combat fatigue cases, motion pictures of battle, with sound gradually added, relieved startle reaction and (to a degree) anxiety. Twelve 15-minute showings produced "marked improvement" in all but one of 14 patients. (L. P.)

JACKEL, M. M.: *Precipitating Factors in the War Neuroses*. The Military Surgeon, 98:326, 1946.

"The basic problem in the neurotic reaction to combat experience centers about anxiety and its causation." Fear is a normal reaction to danger. Anxiety, too, is a reaction to danger, but here the danger involves subconscious conflicts and needs. Since the causes are hidden, the patient cannot bring reason to bear on his problem and a feeling of helplessness is characteristic. The author has found anxiety to be frequently associated with guilt feelings in the war neuroses. Most children are brought up in the belief that wrong-doing is of necessity punished. To many, punishment becomes the only means of expiation for "sin," and anxiety is present until punishment is secured. The author found a persistence of this pattern into adult life quite common in war neuroses. Often a specific event can be elicited, which acted as antigen in precipitating the "breakdown." Several typical cases are cited.

The author purposely omitted many important psychic dynamisms, such as identification projection and ambivalence, in his discussion. The author feels that insight into such factors is not necessary for the relief of the patients, and often harmful. Simple analysis of the specific guilt situation is frequently beneficial to the patient. (O. P.)

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BOOK REVIEWS

WHITE, B. V., COBB, S., AND JONES, C. M.: *Mucous Colitis*. New York, Psychosomatic Medicine Monograph No. 1, 1939, 103 pp. \$2.00.

This is a reprint of a monograph which has been out of print for several years. It is a study of the anatomy, physiology, pathology, psychopathology, diagnosis, and treatment of the colon illness variously termed spastic colon, irritable colon, spastic colitis, mucous colitis, etc.

The studies were comprehensive in conception; executed with great care, discrimination and healthy self-examination. The result is a minor medical classic. I know of no study of mucous colitis anywhere in medical literature of even comparable excellence.

Certain of the authors' conclusions may be challenged. Their description of the personality of the patient with mucous colitis is—like most descriptions of the personality of people with other syndromes—a little too pat. As Cobb himself has pointed out elsewhere, the descriptions of personality are too similar; the clinical syndromes too different. Their remarks on treatment are by and large the soundest I know of.

This monograph is urgently recommended to all clinicians interested in the subject of mucous colitis. It repays repeated reading.

MACK LIPKIN

MASSERMAN, JULES H.: *Principles of Dynamic Psychiatry including an Integrative Approach to Abnormal and Clinical Psychology*. Philadelphia, W. B. Saunders, 1946, 322 pp. \$4.00.

Herein the brilliant young Assistant Professor of Psychiatry at the University of Chicago presents a biodynamic exposition of clinical-psychiatric and animal-experimental observations correlated with four newly-enunciated principles of behavior. *Biodynamics* is a new term, short for *biologic dynamisms*; *biodynamic* is equivalent to *psychosomatic* in the sense the latter term conveys in this journal, but does not have the limitation to human organisms which covertly adheres to *psychosomatic*.*

* Since the editors of this journal have wisely excluded terminologic polemics, allowing articles operationally to evoke the significance of the key term *psychosomatic*, interested readers are referred to Iago Galdston's essay, "Biodynamic medicine versus psychosomatic medicine" (Bull. Menninger Clin., 8:116, 1944), for an independently arrived at discussion of the necessity for a new term. Masserman declares *psychosomatic* to be a "posthoc correlation" of "artificially isolated aspects of the whole."

Masserman has endeavored to meet the following self-asserted criteria for a biodynamic organon of behavior: Such a system 1) must be firmly biologic, 2) must deal with empiric observations of behavior in its total context—i.e., must be holistic and acknowledge the organism-as-a-whole-in-environment continuum, 3) cover the entire range of behavior from ameba to man, 4) in all its alterations and variations, 5) must account for interorganismic and group phenomena, and 6) must be self-consistent and pragmatic, have prognostic validity, and furnish a rationale for clinically effective therapy.

In the present work criteria one, two and four are met, albeit succinctly. A forthcoming companion volume on clinical and therapeutic aspects presumably will fulfill criterion six. The other two criteria receive token coverage in the present volume, which is in two parts: development of behavior, and biodynamics of normal and abnormal behavior. Part I includes a cogent review of organic, psychologic and psychoanalytic formulations of behavior, and an exposition of normative, "neurotogenic" and psychotic dynamisms.

Part II opens with a biodynamic criticism of current behavior theories. Psychoanalysis is criticized for its lack of biologic integration and "a peculiarly myopic over-emphasis on the transcendence of sex function, despite the fact that such a concept [is] at direct odds with everyday observations that simpler physiologic cravings such as thirst, pain or a need for warmth or air can supersede all other motivations and occasion behavior inexplicable on any other basis," its reifying tendencies, its dualism, its traditionalism, and its sanguine dependence on verbal insight therapy.

However, progressive analysts are explicitly recognized, and the statement is made that "except for differences in terminology and breadth of biologic application, modern analytic formulations do not differ markedly from the biodynamic principles of behavior" herein presented.

These principles and their corollaries are surveyed in a preliminary fashion. They are:

1. *Motivation*: "Behavior is basically actuated by the physiologic needs of the organism. . . ."

2. *Experimental Interpretation and Adaptation*: "Behavior is contingent upon, and adaptive to, the organism's *interpretations* of its total milieu, as based on its capacities and previous experiences."

3. *Deviation and Substitution*: "Behavior patterns become deviated and fragmented under stress, and

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Med. when further frustrated, tend toward substitutive satisfactions."

mytal Med. 4. *Conflict*: "When in a given milieu two or more motivations come into conflict in the sense that their accustomed consummatory patterns become incompatible, kinetic tension (anxiety) mounts and behavior becomes hesitant, vacillating, erratic, and poorly adaptive (neurotic) or excessively substitutive, symbolic and regressive (psychotic)."

States. Language in its behavioral and therapeutic aspects is accorded a chapter. The final chapter contains a refutation of criticisms of biodynamic theory.

g self- There are references at the close of each chapter, and 39 clinical histories, mostly brief, along with 20 animal experiments, are pertinently interspersed in the text proper, which occupies only slightly more than half the book. Appendices include 1) an illustrative psychoanalysis of a case of anorexia nervosa syndrome, 2) a review of psychoanalytic formulations of depression and mania, and 3) an article on principles of group communication as exemplified in wartime propaganda. In addition there is a glossary of 1200 psychiatric terms and a bibliography of over 1000 titles, practically all English.

ur are While Masserman's biodynamic hypotheses undoubtedly represent a formulational advance of a dynamic, operational, integrative, and non-elementalistic nature, they appear almost glibly commonsensical. I feel that the exegesis of his principles is inadequate in the following respects, none of them damaging:

panion amably receive n two ics of cogent nalytic rma 1. The crucial difference between man and animals is not delineated—i.e., it is not explicitly acknowledged that men can abstract to an indefinite number of levels while animals can abstract only to a limited number, and that this ability accounts for man's capacity for building bridges and theories, atom bombs and electron microscopes, and enormously increases the complexities of his adjustments and maladjustments. A theory encompassing human behavior must leave a niche for values. Biologic survival value is not enough for human beings; survival for humans must be on a human level, not on a dog level or cat level. In this respect a theory based on operationalism alone is insufficient, as witness the aridness of behaviorism, against which Masserman voices many strictures.

urrent for its myopic nction, t odd biologic nth or occasion eifying nd in 2. Psychoanalytic terminology is incorporated or employed without *comprehensive* biodynamic definition; this will confuse the student.

recog. or diff. applica mark- navior? 3. Choice of symptom, especially in "psychosomatic" syndromes, is neglected. In this connection, and in order to compare theoretic systems, consult Dunbar's chapter on Considerations of theory in *Psychosomatic Diagnosis*.

eyed in by the "Be the or used on pattern ss, and All in all, there can be no doubt that Masserman has produced an exemplary up-to-the-minute systematization of dynamic psychiatry, a presentation that is succinct yet comprehensive, straightforward yet richly vigorous in style, and lively in its freshness and provocative enthusiasm. It is the introductory psychiatric

textbook of my choice, and its companion volume is eagerly anticipated.

The publishers have happily broken with their traditions and provided a new and distinguished looking format and typeface—but their appearance is occasionally marred by an alien typefont mixed with the regular.

LOUIS PAUL

FLUGEL, JOHN CARL: *Man, Morals and Society*. New York, International University Press, 328 pp. \$4.50.

The first three quarters of this book consist of an outline of psychoanalytic theory and especially of the Freudian theory of the development of the super-ego. Here the author has achieved a readable and intelligible account which can be recommended to the layman who is willing to devote serious attention to the problem of the psychological bases of morality in occidental cultures. In particular, Flugel is to be congratulated upon drawing together a great deal of work that is not ordinarily regarded as psychoanalytic. This book includes not only the orthodox Freudian formulations but also a large amount of supporting material from experimental psychology.

It is, however, the last quarter of the book which the author regards as of prime importance. In his words, it is as an attempt to "consider the possible bearings of the recent psychology of moral motives upon the ethical problems of an admittedly distracted world that the present book must stand or fall." In sum, Flugel derives from his psychoanalytic study of morality eight directions of change in character structure which he believes would be desirable. These are: 1. From egocentricity toward sociality; 2. From unconscious toward conscious control of the individual mental life; 3. From autism toward realism; 4. From moral inhibition toward spontaneous "goodness"; 5. From aggression toward tolerance and love; 6. From fear toward security; 7. From heteronomy toward autonomy; and 8. From orectic (moral) judgment toward cognitive (psychological) judgment. These directions of change Flugel regards as summarizing very broadly three types of change from which the whole argument is derived. These three types of change are: a. the changes which occur in the individual as he becomes an adult; b. the changes which psychoanalytic therapy strives to bring about in the individual patient; and c. the changes which have (supposedly) occurred in the evolution of "higher" from "lower" human societies.

Now, the problem is to save the baby while throwing out the bathwater. The neurotic savage became obsolete as soon as anthropologists began the serious objective psychological study of contrasting cultures, and today this notion is as completely discarded as those of the "noble savage" and evolutionary stages of culture. There is no reason to believe that the cultures of the world have the ethos of psychoanalysis (or that of

Protestantism, to which psychoanalysis owes much) as an evolutionary goal.

But the fact that Flugel supports his thesis by invoking an incorrect generalization does not necessarily condemn the thesis. Similarly Flugel need not be dismayed when we doubt whether his eight directions of change correspond to the changes which occur in the growing up of *all* children, and mention that among the Manus people animism is almost absent among children but well developed among the adults.

Actually Flugel's thesis is strengthened if we regard it as culturally derived and derived specifically from the occidental cultural scene (albeit from an indiscriminate mixing of Austrian English and American elements). It is, after all, in the occidental scene that he advocates the application of his recommendations and it is to fit this scene that they must be custom-built. If the changes which Flugel recommends are in fact therapeutic for individuals in our culture, and if the social stresses of our communities are in fact caused by the types of individual pathology for which the changes are therapeutic, then Flugel has a very strong case for his recommendations—provided that they can be carried out. If all were as "grown up" and "realistic" as our practising psychoanalysts, we might have a world—not indeed free from expressions of hostility but one in which expressed hostilities would less often bring about the total disruption of society, starvation and death.

There remain, then, two questions—first, are the social stresses of our time caused by neurosis, and second, are Flugel's recommendations practical? And these questions are closely related one to the other.

As to the first, we must note that a very strong case can be made out for Flugel's position, which has indeed been argued convincingly by other authors. But also we must acknowledge that such order as is achieved in contemporary communities (and intranationally we are a very orderly people) is also based on the same "neurotic" super-ego mechanisms. We may grant that conceivably a totally different machinery might be constructed which would perform the same functions without the attendant dysfunction, but to build this machinery might take years or generations. How then are we to change from one system to another? What machinery will maintain order during the shift? Is it possible that our present ills are caused by social changes of precisely this type? Are our ills comparable with those of a savage society disrupted by contact with another culture rather than with those of a neurotic individual within a relatively steady culture?

Flugel indeed pays very little attention to the realities of social organization and cultural change, seeing social mechanisms only as they are reflected within the psychology of the individual. Such a restricted view is appropriate in a "pure" science where the problems must be artificially simplified in order to achieve theoretical integration. But in applied science the case is different. Here the whole gamut of the relevant variables must be taken into account in order to make

practical recommendations. We cannot—as applied scientists—allow those who believe in economic determinism to go off into one corner, the anthropologists into another and the psychoanalysts into another. Applied science must always depend upon cooperation between the specialists.

In one place, it is true, Flugel achieves an overall view, and here his recommendation is so important that it must be given special notice although the paragraph concerned (p. 315) are only incidental to the main theme of the book. Flugel points out that probably the failure of the League of Nations was due not so much to a lack of police power but rather to lack of any machinery which would promote loyalty. He points out that the League had no flag or anthem and insists that deficiencies of this type must be remedied in any future supra-national institution. The supra-national loyalty must, in the end, transcend the ties to family, party and nation, and when we begin to feel this loyalty we shall readily enough grant power of all kinds to the institution. Here I believe that we have a practical and urgent social problem which should be attacked simultaneously by all types of social scientists. The psychoanalyst knows much about the ontogeny of loyalty, the anthropologist knows about the sorts of social machinery by which chieftains, governments and other symbolic structures become a focus for loyalty and without which their power is necessarily unstable; the political scientists have views on what is practical in the current scene; and so on. Flugel has here put his finger on a point of utmost urgency and one which is certainly within our scope.

GREGORY BATESON

HERZ, ERNST, AND PUTNAM, TRACY J.: *Motor Disorders in Nervous Diseases*. New York, King's Crown Press, 1946, 184 pp. \$3.00.

This monograph was developed as a descriptive syllabus for neurological teaching films; possibly it would be better reviewed in conjunction with the films rather than separately. The authors found their syllabus barren without illustrations and therefore it "metamorphosed" into an atlas. The work reminds the reviewer of nothing so much as Monrad-Krohn's excellent little book on the clinical examination of the nervous system, which in part it duplicates and enhances; both books serve as competent guides for students and house officers.

The authors have succeeded in performing the task they set for themselves; the motor disorders of neurological disease are covered well. Those of mental disease are quite meagerly considered within the confines of a single page; possibly the book would better have been titled, *Motor Disorders in Neurological Disease*. Involuntary movement, disorders of coordination and of the vestibular system, and motor disorders involving cranial nerves are thoroughly reviewed. The use of enlargements from 16 mm. moving picture film for illustration has been both successful and unsuccessful

in some instances this technique shows movement in the successive frames, others (e.g., figure 16) are so bad as to have been omitted; poor focussing and arrangement of the subject is discouraging in some of the strips. Illustrations other than a few of those taken from movie films enhance the text considerably.

In the discussion of the reflexes, the terms periosteal and tendon reflexes are ill-advised. Too often in a search for the "radial periosteal reflex" (page 62) more than a few students and interns have been led to believe that the area where periosteum is reasonably accessible is only that from which the radial reflex may be elicited. Accordingly one can not subscribe to the authors' statement that "The radius is tapped just three or four inches above the external condyle . . ." (page 62) in testing for the radial reflex, which surely may be elicited by a tap delivered anywhere over the radius between wrist and elbow. The terms, deep and superficial reflexes have served us faithfully in the clinical field, terminology which seems appropriate since the former have proprioceptive receptors in muscles and tendons, the latter exteroceptive receptors in skin and mucous membranes.

In the discussion about reflexes it might have been noted that the most advantageous position in which to obtain the ankle jerk (page 65) is with the subject sitting relaxedly with the feet flat on the floor; which requires of course flexibility in the examiner's mid-section. On page 72 Hoffmann's name is spelled differently in succeeding lines, and is again misspelled on pages 172 and 177.

A quite frequent failing of medical publications, that of indicating Argyll Robertson to have been two persons, is perpetuated here (page 178).

In the final paragraph of the chapter devoted to involuntary movements it is noted, "In every instance, abnormal involuntary motor activity should be thought of as a 'release phenomenon,' the result of loss of inhibitory action of a 'higher' controlling center." The seeming authority lent this statement by the first three words is perhaps somewhat negated by the high incidence of quotes in the sentence. However, continuing with their line of thought, it would be helpful to know what the authors believe about the effect of sleep on tremor, which is nowhere discussed in the book though it is probably the most pregnant fact known about the subject. If there ever was a condition *par excellence* in which a "release phenomenon" (e.g., the Babinski) occurs as well as "loss of inhibitory action of a 'higher' controlling center," it is during sleep. Yet practically without exception sleep relieves involuntary movements of all descriptions. It would be interesting to know how the authors might resolve this seeming paradox; where the acme of release and removal of inhibiting action not only does not enhance but as a matter of fact relieves involuntary movement.

Though I found no word of explanation for the movement produced in muscle when it is percussed, there has been struck in the discussion a proper balance

of anatomy and physiology; an accomplishment not as often attained as it should be in clinical writings. What a deluge of verbiage we should have been spared had other clinical writers been able to do likewise!

The teachings films to which the book is adjunctive are a series of silent 16 mm. black and white films. These include films on abnormal involuntary movements, disorders of gait, disorders of coordination, muscle status, reflexes, skilled acts, oculomotor disorders, facial palsy, disorders of the vestibular system, disorders of the motor trigeminal, spinal accessory, and hypoglossal nerve.

The format is good, the bibliography adequate, and there is an index.

CHARLES D. ARING

BECK, SAMUEL J.: *Rorschach's Test*. Volume 2. New York, Grune and Stratton, 1945, 402 pp. \$5.00.

In this second volume Beck completes the exposition begun in the first under the sub-title "Basic Processes." While in the earlier part of the total work the administration and scoring of the Rorschach Test were outlined and illustrated, in the present volume the interpretation of results is the theme. After two introductory chapters a series of 47 complete Rorschach records are presented in detail and interpreted in full.

Beck has made a distinguished contribution in this second part of his work. While Chapter I is perhaps unduly impressionistic and will raise questions in the minds of more systematic thinkers than he, the second chapter provides a distinct compensation. In the latter, one finds within the compass of 50 pages the best existing exposition of the significance of the various Rorschach categories in their multiple relationships. The account is by no means uniform as to fullness of detail but this treatment is in agreement with the author's available information. He studiously admits, when necessary, the incompleteness of knowledge regarding one or another test factor.

One misses, however, an exposition of some of the general principles in terms of which the Rorschach method—in common, to some degree, with other projective techniques—must be interpreted. The student could profit considerably from a better appreciation of the postulates upon which Rorschach interpretation proceeds: the nature of norms, the general significance of patterns in Rorschach results and the use of "signs," as well as the more general principles connected with the "analogizing" upon which Rorschach interpretations are founded. Obviously this omission can be supplied by an instructor using the text, but the inclusion of such a discussion would have helped the average student a good deal in his orientation to the less general discussion in Chapter II and to the concrete case presentations that follow.

The second main portion of the work—the case illustrations—represents a unique contribution to Rorschach literature. Nowhere else is to be found a similar array of detailed Rorschach records with a full and, at

times, bold interpretation of the entailed personality pictures. Regardless of whether every Rorschach examiner—let alone every psychologist—would agree with the interpretations made by Beck, the mere publication of these records, together with the full statement of conclusions from each, makes it possible for the method to undergo a critical examination at the hands of both the initiated and the uninitiated—an opportunity unparalleled in the literature to date. The selection of the cases is, on the whole, broad, there being included the various levels of intelligence, records from adolescent subjects, the varieties of schizophrenia, and the neuroses, as well as four paired records—before and after various critical experiences: psychosis and remission, murder and imprisonment, before and during psychoanalysis. Many readers will miss illustrative records from subjects younger than the adolescent group and some will regret the absence of cases of the organic and affective psychoses. But Beck was obviously not attempting to be exhaustive; he preferred apparently to present cases representing the stress of his own experience.

Those acquainted with Beck's first book—*Introduction to the Rorschach Method*—will note a methodological change in the present volume which is at the same time both more and less conservative. While in the earlier work the various chapters, each devoted to a particular diagnostic category, were introduced by a page or two of general discussion, preceded by a paradigm for the correlated Rorschach pattern, the present volume notably omits such schematizations. Each chapter is baldly empirical. Such conclusions as are to be drawn about the feeble-minded, the neurotic or the schizophrenic individual, for example, must be drawn by induction from the individual case presentations as supplemented by the general comments in Chapter II. What one finds in these diagnostic chapters, instead of the omitted general characterizations, is an exhaustive employment of detail interpreted on the postulate of psychic determinism. The close relationship between the psychoanalytic approach and the Rorschach method—which was, of course, inherent in Rorschach's own original orientation—is evident in the present work.

The style in which the case interpretations are written will at times pique the reader. An occasional flash of dogmatism—a conclusion drawn from evidence seemingly insufficient or, at least, insufficiently presented—is fortified by a too carefully chosen phrase. One is sometimes overconscious of the care with which the author has selected his words or phrases—as if he were attempting to avoid somewhat too conscientiously the repetition of some essential common expression. The defect is, however, not serious since, on the whole, the exposition is lucid and one almost always knows to which details of the record a particular interpretive statement owes its existence.

In general, this second volume is superior to the first. It more nearly represents a unique contribution. The importance of the earlier volume is nonetheless very real—as was brought out in an earlier review. No reader of the total work can fail to appreciate the sincere effort of the author to establish the Rorschach method on a firm research basis, his willingness to present his interpretations—sound or unsound—for what they may be worth, and a certain evidence of liveliness in the understanding of the individual human being, which is all too infrequently encountered in textbooks of personality. Taken together Beck's two volumes constitute the best existing single work on the Rorschach method of personality diagnosis.

SAUL ROSENZWEIG

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